



DO NOT REMOVE FROM LIBRARY

NORTHEASTERN UNIVERSITY COURSE DESCRIPTIONS



NORTHEASTERN UNIVERSITY BULLETIN

**1973
1974**

COURSE DESCRIPTIONS FOR THE BASIC COLLEGES

Boston-Bouvé College
College of Business Administration
College of Criminal Justice
College of Education
College of Engineering
College of Liberal Arts
Lincoln College
College of Nursing
College of Pharmacy and
Allied Health Professions

The University reserves the right to make changes
in the regulations and courses announced in this bulletin.

Printed at Northeastern University.

Contents

Academic Requirements	5
Boston-Bouvé College	5
College of Business Administration	9
College of Criminal Justice	14
College of Education	15
College of Engineering	21
Lincoln College	27
College of Liberal Arts	28
College of Nursing	35
College of Pharmacy and Allied Health Professions	37
Course Descriptions	41

Boston-Bouvé College

PHYSICAL EDUCATION- Men and Women

10.104, Fundamentals of Mathematics; 50.121, Human Development and Learning I; 62.250, Anatomy and Physiology I; a Physical Education elective; and an elective. **Quarter 4**

50.131, Human Development and Learning II; 50.141, Measurement and Evaluation; 62.251, Anatomy and Physiology II; 62.218, Elementary School Activities or an elective; and a Physical Education elective. **Quarter 5**

62.221, Perceptual-Motor Learning and Development; 62.252, Anatomy and Physiology III; 62.255, Adapted Physical Education; 62.275, Critical Teaching Skills; and a Physical Education elective. **Quarter 6**

62.210, History and Principles of Physical Education; 62.253, Kinesiology; 62.260, Measurement and Evaluation; a Physical Education elective; and an elective. **Quarter 7**

OR

62.277, Outdoor Teaching Lab; 62.218, Elementary School Activities I or 62.256, Athletic Training and Conditioning; two coaching electives; and a Boston-Bouvé' College elective.

PHYSICAL EDUCATION- Women; Five-Year Plan

60.140, Analysis and Teaching of Physical Activities I; 60.141, Analysis and Teaching of Physical Activities II; 60.143, Winter Sports; 60.160, Instructional Technology; 60.220, Program and Methods in Elementary School Physical Education Activities; 62.260, Measurement and Evaluation; 65.216, Methods and Materials in Health Education. **Quarter 8**

60.142, Analysis and Teaching of Physical Activities III; 62.253, Kinesiology; 62.254, Exercise Physiology; 62.255, Adapted Physical Education; 63.135, Social Recreation or 63.215, Trends and Issues in Recreation; 65.218, Public Health; 62.280, Curriculum Development; and an elective. **Quarter 9**

62.282, Supervised Student Teaching. **Quarter 10**

62.254, Exercise Physiology; 62.280, Curriculum Development; 62.270, Administration of Physical Education; 60.230, Advanced Teaching and Analysis or 62.293, Special Problems; and one of the following Education Humanities electives: 50.152, Comparative Education, 50.153, Philosophy of Education, or 50.154, Current Issues in American Education. **Quarter 11**

PHYSICAL EDUCATION- Men; Five-Year Plan

- Quarter 8** 61.212, Handball and Squash; 61.263, Methods and Materials in Physical Education; 62.253, Kinesiology; 62.260, Measurement and Evaluation; and an elective.
- Quarter 9** 61.220, Survey of Recreation Sports; 61.237, Team Sports III; 61.280, Camp Leadership; 62.256, Athletic Training and Conditioning; 63.215, Trends and Issues in Recreation; 65.215, School and Community Health; and a Physical Education elective.
- OR
- 61.230, Secondary School Dance; 29.100, Public Speaking; a combatives elective; a coaching elective; a Physical Education elective; and two other electives.
- Quarter 10** 62.282, Supervised Student Teaching.
- Quarter 11** 62.254, Exercise Physiology; 62.255, Adapted Physical Education; 62.270, Administration of Physical Education; a Physical Education elective; and one of the following Education Humanities electives: 50.152, Comparative Education, 50.153, Philosophy of Education, or 50.154, Current Issues in American Education.

PHYSICAL EDUCATION- Women; Four-Year Plan

- Quarter 9A** 62.282, Supervised Student Teaching; or Quarter 10A.
- Quarter 10A** 62.254, Exercise Physiology; 62.255, Adapted Physical Education; 65.218, Public Health; and an elective or one of the following three courses: 60.230, Advanced Teaching Analysis, 62.292, Special Problems, 62.293, Special Problems; or Quarter 9A.

HEALTH EDUCATION

- Quarter 4** 30.113, Freshman Writing; 50.121, Human Development and Learning I; 62.250, Anatomy and Physiology I; 65.116, Nutrition.
- Quarter 5** 30.114, Introduction to Literature; 50.131, Human Development and Learning II; 62.251, Anatomy and Physiology II; and an elective.

HEALTH EDUCATION - Transfer Program

10.104, Fundamentals of Mathematics; 50.114, Education and Social Science; 50.121, Human Development and Learning I; 65.110, Foundations of Health Education; and a Boston-Bouve' College elective.	Quarter 6
18.142, Basic Animal Biology; 50.131, Human Development and Learning II; 65.114, Mental Health; a Physical Education elective; and one of the following Education Social Science electives: 50.161, Seminar in Group Process, 50.163, Schools as Social Systems, 50.164, Class and Ethnic Relations in Education, 50.165, Organization and Politics of School Systems, 50.166, Teaching and the Human Service Professions, 50.167, Education and Psychosocial Development, or 50.168, Education and Social Change.	Quarter 6A
19.146, Motivation, or its equivalent; 50.141, Measurement and Evaluation; 65.222, Drug Use and Abuse; 20.259, Urban Anthropology, or its equivalent; and a Physical Education elective.	Quarter 7
55.121, Introduction to Special Education; 65.116, Nutrition; 65.140, Concepts in Health, Aging, and Longevity; 65.223, Human Sexuality and the Family.	Quarter 8
65.217, Teaching Procedures/Curriculum in Health Education in School and Community; 65.207, First Aid, Safety and Preventive Health Education; 65.238, Seminar; and an Education Humanities elective.	Quarter 9

PHYSICAL THERAPY

11.171, Physics for the Life Sciences I; 11.173, Physics Laboratory for the Life Sciences I; 18.125, Human Physiology I; 19.102, Basic Psychology; and an elective.	Quarter 4
11.172, Physics for the Life Sciences II; 18.126, Human Physiology II; 18.148, Human Anatomy; 64.115, Introduction to Physical Therapy; and an elective.	Quarter 5
18.125, Human Physiology; 19.140, Normal and Abnormal Human Development; 64.121, Gross Anatomy; and an elective.	Quarter 6
64.131, Applied Anatomy; 64.143, Physical Therapy I; 64.210, Pathology; 64.220, Clinical Medicine I; 65.218, Public Health.	Quarter 7A
18.126, Human Physiology; 64.154, Physical Therapy II; 64.155, Physical Therapy III; 64.221, Clinical Medicine II; 64.234, Psychiatry; 64.250, Neuroanatomy.	Quarter 8A
64.222, Clinical Medicine III; 64.164, Physical Therapy IV; 64.165, Professional Literature and Research; 64.166, Rehabilitation; 64.172, Physical Therapy VI; 64.185, Supervised Clinical Practice.	Quarter 9A

Quarter 10A 64.171, Physical Therapy V; 64.174, Physical Therapy VII; 64.175, Ethics and Administration; 64.246, Applied Physiology; 64.187, Supervised Clinical Practice.

Quarter 11A 64.195, Supervised Clinical Practice.

RECREATION EDUCATION

Quarter 4 16.121, Natural History I; 50.121, Human Development and Learning I; 63.150, Anatomy and Physiology I; 63.133, Recreation Skills IV; and an elective.

Quarter 5 16.122, Natural History II; 50.131, Human Development and Learning II; 63.151, Anatomy and Physiology II; 63.134, Recreation Skills V; and an elective.

Quarter 6 29.163, Play Production; 63.126, Outdoor Education I; 63.255, Therapeutic Recreation; 63.267, Introduction to Youth Groups; 63.270, Arts and Crafts.

Quarter 7 63.160, Recreation Resources; 63.127, Outdoor Education II or 63.128, Survey of Outdoor Education and Park Facilities; and two electives.

Quarter 8 63.143, Winter Sports; 63.220, Methods and Materials in Recreation; 63.240, Dance and Cultures; 63.250, Group Dynamics; 63.260, Administration of Recreation and Parks; 63.262, Recreation and Budgeting and Financing.

Quarter 9 63.280, Supervised Field Experience and Teaching.

Quarter 10 63.143, Winter Sports; 63.210, Philosophy of Recreation; 63.260, Administration of Recreation and Parks; 63.285, Introduction to Research; 65.218, Public Health; and two of the following three courses: 63.146, Camp Administration, 63.256, Recreation Activities for Atypical Individuals and Groups I, 63.267, Introduction to Youth Groups.

Quarter 11 63.147, Outdoor Education for the Handicapped; 63.290, Research Seminar; 50.152, Comparative Education or 50.153, Philosophy of Education; and two of the following courses: 63.129, School Camping - Organization and Administration, 63.257, Recreation Activities for Atypical Individuals and Groups II, 63.262, Recreation and Budgeting and Financing, 63.266, Recreation and Community Schools.

College of
Business
Administration

ACCOUNTING

39.105, Principles of Economics; 43.120, Introduction to Marketing or 44.120, Introduction to Financial Activity; 49.250, Quantitative Methods I; and a liberal elective.	Quarter 4
39.106, Principles of Economics; 43.120, Introduction to Marketing, or 44.120, Introduction to Financial Activity; 49.251, Quantitative Methods II; and a liberal elective.	Quarter 5
41.251, Intermediate Accounting; 41.253, Cost Accounting I; 45.209, Organization Behavior I; and a liberal elective.	Quarter 6
41.252, Intermediate Accounting; 41.254, Cost Accounting II; 45.210, Organization Behavior II; and a liberal elective.	Quarter 7
41.262, Accounting Theory and Practice; a liberal elective; a Business elective; and an open elective.	Quarter 8
41.263, Accounting Planning and Control; 45.250, Business and Society; a liberal elective; and an open elective.	Quarter 9
45.112, Business Policy; 90.251, Placement Techniques; a liberal elective; and an open elective.	Quarter 10
All open electives.	Quarter 11

FINANCE AND INSURANCE

39.105, Principles of Economics; 43.120, Introduction to Marketing, or 44.120, Introduction to Financial Activity; 49.250, Quantitative Methods I; and a liberal elective.	Quarter 4
39.106, Principles of Economics; 43.120, Introduction to Marketing, or 44.120, Introduction to Financial Activity; 49.251, Quantitative Methods II; and a liberal elective.	Quarter 5
44.150, Corporate Financial Management; 44.151, Interpreting Financial Data; 45.209, Organization Behavior I; and a liberal elective.	Quarter 6
44.275, Money and Economic Activity; 44.260, Financial Planning; 45.210, Organization Behavior II; and a liberal elective.	Quarter 7
A liberal elective; a Finance elective; a Business elective; and an open elective.	Quarter 8
45.250, Business and Society; a Finance elective; a liberal elective; and an open elective.	Quarter 9
45.112, Business Policy; 90.251, Placement Techniques; a liberal elective; and an open elective.	Quarter 10
All open electives.	Quarter 11

GENERAL BUSINESS ADMINISTRATION

- Quarter 4** 39.105, Principles of Economics; 43.120, Introduction to Marketing, or 44.120, Introduction to Financial Activity; 49.101, Introduction to the Computer; 49.250, Quantitative Methods I; and a liberal elective.
- Quarter 5** 39.106, Principles of Economics; 49.251, Quantitative Methods II; 43.120, Introduction to Marketing or 44.120, Introduction to Financial Activity; and a liberal elective.
- Quarter 6** 45.209, Organization Behavior I; a liberal elective; a Business elective; and an open elective.
- Quarter 7** 45.210, Organization Behavior II; a liberal elective; a Business elective; and an open elective.
- Quarter 8** A liberal elective; a Business elective; and an open elective.
- Quarter 9** 45.250, Business and Society; a liberal elective; a Business elective; and an open elective.
- Quarter 10** 45.112, Business Policy; 90.251, Placement Techniques; a liberal elective; a Business elective; and an open elective.
- Quarter 11** A Business elective; and open electives.

INDUSTRIAL RELATIONS

- Quarter 4** 39.105, Principles of Economics; 43.120, Introduction to Marketing or 44.120, Introduction to Financial Activity; 49.250, Quantitative Methods I; and a liberal elective.
- Quarter 5** 39.106, Principles of Economics; 43.120, Introduction to Marketing or 44.120, Introduction to Financial Activity; 49.251, Quantitative Methods II; and a liberal elective.
- Quarter 6** 45.209, Organization Behavior I; a liberal elective; a Business elective; and an open elective.
- Quarter 7** 39.275, Labor Economics; 45.210, Organization Behavior II; a liberal elective; and a Business elective.
- Quarter 8** 45.260, Personnel - Industrial Relations; a liberal elective; a Business elective; and an open elective.
- Quarter 9** 45.250, Business and Society; a liberal elective; a Business elective; and an open elective.
- Quarter 10** 45.112, Business Policy; 45.275, Labor Law; 90.251, Placement Techniques; a liberal elective; and an open elective.
- Quarter 11** 45.276, Seminar in Collective Bargaining; and open electives.

INTERNATIONAL BUSINESS ADMINISTRATION

39.105, Principles of Economics; 43.120, Introduction to Marketing; 49.250, Quantitative Methods I; and a liberal elective.	Quarter 4
39.106, Principles of Economics; 44.120, Introduction to Financial Activity; 49.251, Quantitative Methods II; and a liberal elective.	Quarter 5
45.209, Organization Behavior I; 46.100, Introduction to International Business; a liberal elective; and an open elective.	Quarter 6
45.210, Organization Behavior II; a Business elective; a Liberal International elective; and an open elective.	Quarter 7
A Business International elective; a Business elective; a liberal elective; and an open elective.	Quarter 8
45.250, Business and Society; a Business elective; a Liberal International elective; and an open elective.	Quarter 9
45.112, Business Policy; 90.251, Placement Techniques; a Business International elective; a liberal elective; and an open elective.	Quarter 10
46.101, Seminar in International Business; and open electives.	Quarter 11

MANAGEMENT

39.105, Principles of Economics; 43.120, Introduction to Marketing or 44.120, Introduction to Financial Activity; 49.250, Quantitative Methods I; and a liberal elective.	Quarter 4
39.106, Principles of Economics; 43.120, Introduction to Marketing or 44.120, Introduction to Financial Activity; 49.251, Quantitative Methods II; and a liberal elective.	Quarter 5
45.209, Organization Behavior I; 49.206, Management Information Systems or 41.205, Cost Accounting for Management; a liberal elective; and an open elective.	Quarter 6
45.210, Organization Behavior II; 41.205, Cost Accounting for Management or 49.206, Management Information Systems; a liberal elective; and an open elective.	Quarter 7
45.260, Personnel - Industrial Relations; 49.155, Legal Aspects of Business; a Business elective; and a liberal elective.	Quarter 8
45.250, Business and Society; 45.265, Production Management; a liberal elective; and an open elective.	Quarter 9
45.112, Business Policy; 90.251, Placement Techniques; a liberal elective; a Business elective; and an open elective.	Quarter 10
All open electives.	Quarter 11

MARKETING

Quarter 4	39.105, Principles of Economics; 43.120, Introduction to Marketing, or 44.120, Introduction to Financial Activity; 49.250, Quantitative Methods I; and a liberal elective.
Quarter 5	39.106, Principles of Economics; 43.120, Introduction to Marketing, or 44.120, Introduction to Financial Activity; 49.251, Quantitative Methods II; and a liberal elective.
Quarter 6	43.250, Marketing Management I; 45.209, Organization Behavior I; a liberal elective; and an open elective.
Quarter 7	43.251, Marketing Management I; 45.210, Organization Behavior II; a liberal elective; and an open elective.
Quarter 8	43.240, Marketing Research; a liberal elective; a Business elective; and an open elective.
Quarter 9	45.250, Business and Society; a Marketing elective; a liberal elective; and an open elective.
Quarter 10	43.278, Competitive Strategy; 45.112, Business Policy; 90.251, Placement Techniques; a liberal elective; and an open elective.
Quarter 11	A Marketing elective; and open electives.

SMALL BUSINESS MANAGEMENT

Quarter 4	39.105, Principles of Economics; 43.120, Introduction to Marketing; 49.250, Quantitative Methods I; and a liberal elective.
Quarter 5	39.106, Principles of Economics; 44.120, Introduction to Financial Activity; 49.251, Quantitative Methods II; and a liberal elective.
Quarter 6	45.209, Organization Behavior I; 45.212, New Venture Creation; a liberal elective; and an open elective.
Quarter 7	45.210, Organization Behavior II; a liberal elective; and open electives.
Quarter 8	44.158, Small Business Finance; 45.130, Operations Analysis and Venture Capital; a liberal elective; and an open elective.
Quarter 9	45.250, Business and Society; a liberal elective; a Business elective; and an open elective.
Quarter 10	45.112, Business Policy; 49.107, Small Business Management; 90.251, Placement Techniques; a liberal elective; and an open elective.
Quarter 11	45.131, Control Systems in Smaller Companies; a Business elective; and open electives.

TRANSPORTATION AND PHYSICAL DISTRIBUTION MANAGEMENT

39.105, Principles of Economics; 43.120, Introduction to Marketing, or 44.120, Introduction to Financial Activity; 49.250, Quantitative Methods I; and a liberal elective.	Quarter 4
39.106, Principles of Economics; 43.120, Introduction to Marketing, or 44.120, Introduction to Financial Activity; 49.251, Quantitative Methods II; and a liberal elective.	Quarter 5
48.101, Principles of Transportation; 45.209, Organization Behavior I; a liberal elective; and an open elective.	Quarter 6
45.210, Organization Behavior II; 48.102, Current Issues in Transportation Policy; a liberal elective; and an open elective.	Quarter 7
A Transportation elective; a Business elective; a liberal elective; and an open elective.	Quarter 8
45.250, Business and Society; 48.104, Physical Distribution Management; a liberal elective; and an open elective.	Quarter 9
45.112, Business Policy; a Transportation elective; a liberal elective; and an open elective.	Quarter 10
A Transportation elective; and open electives.	Quarter 11

College of Criminal Justice

CRIMINAL JUSTICE

- Quarter 4** 22.141, State Government and Politics; 11.113, Physics for Criminal Justice Students I, or 12.139, General Chemistry, or 18.114, Functional Human Anatomy I; a Criminal Justice elective; and an elective.
- Quarter 5** 11.114, Physics for Criminal Justice Students II, or 12.140, General Chemistry, or 18.115, Functional Human Anatomy II; a Criminal Justice elective; and an elective.
- Quarter 6** 92.137, Criminology; 92.141, Criminal Law: Procedural Due Process; and two electives.
- Quarter 7** 92.134, Constitutional Problems I: The Police and The Criminal Suspect; a Criminal Justice elective; and electives.
- Quarter 8** Criminal Justice electives; and electives.
- Quarter 9** Criminal Justice electives; and electives.
- Quarter 10** 90.255, Professional Development in Criminal Justice; Criminal Justice electives; and electives.
- Quarter 11** Criminal Justice electives; and electives.

College of Education

EDUCATION PSYCHOLOGY ELECTIVES

50.121, Human Development and Learning I	Quarter 5
50.131, Human Development and Learning II	
50.132, Creative Expression in Children	
50.133, Educational Applications of Social Psychology	
50.134, Mental Health in Teaching	
50.135, Cross-cultural Studies of Child Rearing and Education	
50.136, Language and Cognition: Educational Implications	
50.137, Seminar in Adolescent Psychology	
50.138, Seminar in Human Learning and Motivation	
50.139, Seminar in Early Childhood Development	

EDUCATION HUMANITIES ELECTIVES

50.152, Comparative Education	Quarter 10
50.153, Philosophy of Education	
50.154, Current Issues in American Education	

ELEMENTARY EDUCATION

55.121, Introduction to Special Education; 16.121, Natural History I; 39.115, Principles and Problems of Economics; and 50.121, Human Development and Learning I.	Quarter 4
55.122, Introduction to Speech and Hearing Therapy or an elective; 16.122, Natural History II; a Speech elective; and an Education Psychology elective (see list).	Quarter 5
19.201, Psychology of Abnormal Behavior or an Area elective; 51.131, Fundamentals of Arithmetic I; 51.135, Analysis of Teaching and Educational Process; 54.135, Fundamentals of Reading I.	Quarter 6
55.240, Psychology of the Mentally Retarded or an elective; 50.141, Measurement and Evaluation or a History elective; 51.132, Fundamentals of Arithmetic II; 54.136, Fundamentals of Reading II.	Quarter 7
51.141, Elementary Education; 50.141, Measurement and Evaluation or 54.141, Remedial Reading or a History elective; an elective; and a Literature elective.	Quarter 8
50.141, Measurement and Evaluation or an elective; 51.142, Elementary Education Compendium II; 54.142, Linguistics and Reading or a History elective; and a Literature elective.	Quarter 9
55.121, Introduction to Special Education or an elective; 90.253, Professional Development for Teachers; an Education Humanities elective (see list); and an elective.	Quarter 10
Two electives.	Quarter 11

TEACHING OF BIOLOGY

- Quarter 4** 12.144, Organic Chemistry I; 18.133, Plant Biology; 50.131, Human Development and Learning II; and a History elective.
- Quarter 5** 12.145, Organic Chemistry II; 18.134, Environmental and Population Biology; a History elective; and an Education Psychology elective (see list).
- Quarter 6** 11.171, Physics for the Life Sciences I; 18.135, Genetics and Development Biology; 51.135, Analysis of Teaching and Educational Process; and a Biology elective.
- Quarter 7** 11.172, Physics for the Life Sciences II; 18.136, Cell Biology; a Biology elective; and an elective.
- Quarter 8** 51.147, Methods and Materials of Teaching the Sciences; 50.141, Measurement and Evaluation or an elective; a Humanities elective; and a Biology elective.
- Quarter 9** 50.141, Measurement and Evaluation or an elective; a Biology elective; a Humanities elective; and an elective.
- Quarter 10** 90.253, Professional Development for Teachers; an Education Humanities elective (see list); Biology electives; and a Literature elective.
- Quarter 11** A Biology elective; and a Literature elective.

TEACHING OF CHEMISTRY

- Quarter 4** 11.117, Physics for Science Majors I; 11.124, Physics Laboratory for Science Majors I; 12.153, Organic Chemistry; 50.131, Human Development and Learning II; and an elective.
- Quarter 5** 11.119, Physics for Science Majors III; 11.125, Physics Laboratory for Science Majors II; 12.154, Organic Chemistry; an Education Psychology elective (see list); and an elective.
- Quarter 6** 12.166, Physical Chemistry; 51.135, Analysis of Teaching and Educational Process; a History elective; and a Chemistry elective.
- Quarter 7** 12.185, Inorganic Chemistry; 12.169, Physical Chemistry; 12.200, Principles of Experimental Chemistry; 12.201, Integrated Chemistry Laboratory I; a History elective; and an elective.
- Quarter 8** 50.141, Measurement and Evaluation or a Humanities elective; 12.170, Physical Chemistry; 12.181, Instrumental Analysis; 51.147, Methods and Materials of Teaching the Sciences; and 12.202, Integrated Chemistry Laboratory II.
- Quarter 9** 50.141, Measurement and Evaluation or a Humanities elective; 12.213, Advanced Inorganic Chemistry; 12.253, Identification of Organic Compounds; a Humanities elective; and an elective.
- Quarter 10** 12.171, Analytical Chemistry or a Chemistry elective; 90.253, Professional Development for Teachers; an Education Humanities elective (see list); a Literature elective; and an elective.
- Quarter 11** 12.171, Analytical Chemistry or a Chemistry elective; and a Literature elective.

TEACHING OF EARTH SCIENCE

11.171, Physics for the Life Sciences I; 16.201, Physical Geology; 16.203, Physical Geology Laboratory; 50.131, Human Development and Learning II; and an elective.	Quarter 4
11.172, Physics for the Life Sciences II; 16.202, Historical Geology and 16.204, Historical Geology Laboratory or an Earth Science elective; a Speech elective; and an Education Psychology elective (see list).	Quarter 5
51.135, Analysis of Teaching and Educational Process; an Earth Science elective; a History elective; and an elective.	Quarter 6
16.202, Historical Geology and 16.204, Historical Geology Laboratory or an Earth Science elective; a History elective; and electives.	Quarter 7
51.147, Methods and Materials of Teaching the Sciences; 50.141, Measurement and Evaluation or an elective; a Literature elective; and an Earth Science elective.	Quarter 8
50.141, Measurement and Evaluation or an elective; a Literature elective; an Earth Science elective; and an elective.	Quarter 9
90.253, Professional Development for Teachers; an Earth Science elective; an Education Humanities elective (see list); and two electives.	Quarter 10
An Earth Science elective; and an elective.	Quarter 11

TEACHING OF ENGLISH

30.110, Literary Analysis: Poetry; 50.131, Human Development and Learning II; an American Literature elective; and a Speech elective.	Quarter 4
30.111, Literary Analysis: Fiction or 30.112, Literary Analysis: Drama; an American Literature elective; an Education Psychology elective (see list); and an elective.	Quarter 5
26.150, Introduction to Logic; 51.135, Analysis of Teaching and Educational Process; a British Literature elective; and an English elective.	Quarter 6
30.120, Introduction to Linguistics or 30.130, Introduction to Semantics; a British Literature elective; an Art or Music elective; and an elective.	Quarter 7
30.120, Introduction to Linguistics or 30.130, Introduction to Semantics or 50.141, Measurement and Evaluation; 30.250, Shakespeare; and 51.143, Methods and Materials of Teaching English.	Quarter 8
50.141, Measurement and Evaluation or an elective; 30.251, Shakespeare; 51.139, Writing and the Teaching of Writing or an elective; and 54.126, Teaching Reading in Secondary Schools.	Quarter 9
90.253, Professional Development for Teachers; an Education Humanities elective (see list); and three electives.	Quarter 10
Two electives.	Quarter 11

TEACHING OF GENERAL SCIENCE

Quarter 4	10.106, Calculus; 11.171, Physics for the Life Sciences I; 12.144, Organic Chemistry; 50.131, Human Development and Learning II.
Quarter 5	10.107, Calculus; 11.172, Physics for the Life Sciences II; a Chemistry elective; and an Education Psychology elective (see list).
Quarter 6	16.201, Physical Geology; 16.203, Physical Geology Laboratory; 51.135, Analysis of Teaching and Educational Process; a History elective; and a Literature elective.
Quarter 8	50.141, Measurement and Evaluation or an elective; 51.147, Methods and Materials of Teaching the Sciences; a Science elective; and a Biology elective.
Quarter 9	50.141, Measurement and Evaluation or an elective; a Science elective; a Biology elective; and a Literature elective.
Quarter 10	90.253, Professional Development for Teachers; a Science elective; an Education Humanities elective (see list); and two electives.
Quarter 11	Two electives.

TEACHING OF MATHEMATICS

Quarter 4	10.184, Calculus and Linear Methods I; 10.186, Differential Equations and Linear Methods I; 50.131, Human Development and Learning II; and an elective.
Quarter 5	10.185, Calculus and Linear Methods II; 10.187, Differential Equations and Linear Methods II; a Speech elective; and an Education Psychology elective.
Quarter 6	51.135, Analysis of Teaching and Educational Process; a Mathematics elective; a History elective; and a Literature elective.
Quarter 7	A Mathematics elective; a Literature elective; a History elective; and an elective.
Quarter 8	Two Mathematics electives; and two electives.
Quarter 9	50.141, Measurement and Evaluation; 51.124, Modern Mathematics Curricula; 51.145, Methods and Materials of Teaching Mathematics; OR Two Mathematics electives; and two electives.
Quarter 10	90.253, Professional Development for Teachers; a Mathematics elective; an Education Humanities elective (see list); and two electives.
Quarter 11	A Mathematics elective; and an elective.

TEACHING OF MODERN LANGUAGES

30.170, Survey of English Literature; 39.115, Principles and Problems of Economics or 26.133, Philosophy of Science or a Science elective; 50.131, Human Development and Learning II; and a Modern Language elective.	Quarter 4
39.116, Principles and Problems of Economics or 26.150, Introduction to Logic or a Science elective; 30.171, Survey of English Literature; an Education Psychology elective (see list); and a Modern Language elective.	Quarter 5
51.135, Analysis of Teaching and Educational Process; two Modern Language electives; and an elective.	Quarter 6
Two Modern Language electives; and two electives.	Quarter 7
50.141, Measurement and Evaluation or an elective; 51.140, Methods and Materials of Teaching Modern Languages I; and two Advanced Language electives.	Quarter 8
50.141, Measurement and Evaluation or a Language seminar; 51.144, Methods and Materials of Teaching Modern Languages II; and two Advanced Language electives.	Quarter 9
90.253, Professional Development for Teachers; two Advanced Language electives; an Education Humanities elective (see list); and an elective.	Quarter 10
Two Advanced Language electives.	Quarter 11

TEACHING OF PHYSICS

10.184, Calculus and Linear Methods I; 11.127, Physics for Science Majors IV; 11.124, Physics Laboratory for Science Majors I; 50.131, Human Development and Learning II; and an elective.	Quarter 4
10.185, Calculus and Linear Methods II; 11.128, Physics for Science Majors V; 11.125, Physics Laboratory for Science Majors II; a Speech elective; and an Education Psychology elective (see list).	Quarter 5
10.250, Analysis I or 10.122, Applied Analysis; 11.200, Intermediate Mechanics; 11.260, Wave Laboratory; 51.135, Analysis of Teaching and Educational Process.	Quarter 6
10.251, Analysis II or 10.222, Applied Analysis; 11.201, Theoretical Mechanics or a Physics elective; a History elective; and an elective.	Quarter 7
12.114, General Chemistry; 50.141, Measurement and Evaluation or an elective; 51.147, Methods and Materials of Teaching the Sciences; and a Physics elective.	Quarter 8
12.115, General Chemistry; 50.141, Measurement and Evaluation or an elective; a History elective; and a Physics elective.	Quarter 9
90.253, Professional Development for Teachers; a Physics elective; a Literature elective; an Education Humanities elective (see list); and an elective.	Quarter 10
A Physics elective; and a Literature elective.	Quarter 11

TEACHING OF SOCIAL STUDIES

- Quarter 4** 23.210, The United States to 1877; 26.150, Introduction to Logic; 39.115, Principles and Problems of Economics; 50.131, Human Development and Learning II.
- Quarter 5** 23.211, The United States since 1877; 39.116, Principles and Problems of Economics; a Speech elective; and an Education Psychology elective (see list).
- Quarter 6** 23.199, The Historian's Craft; 51.135, Analysis of Teaching and Educational Process; a History elective; and a Literature elective.
- Quarter 7** 39.280, Comparative Economics; 50.141, Measurement and Evaluation; a Political Science elective; and a Literature elective.
- Quarter 8** 51.149, Methods and Materials of Teaching Social Studies; 50.154, Current Issues in American Education.
- Quarter 9** 54.126, Teaching Reading in Secondary Schools; a Political Science elective; a History elective; and a Humanities elective.
- Quarter 10** 90.253, Professional Development for Teachers; a History elective; a Social Science elective; and two electives.
- Quarter 11** All electives.

SPEECH AND HEARING THERAPY

- Quarter 4** 50.121, Human Development and Learning I; 55.121, Introduction to Special Education; 55.126, Communication Skills; and a History elective.
- Quarter 5** 55.122, Introduction to Speech and Hearing Therapy; 55.124, Anatomy, Physiology, and Neurology of the Speech and Hearing Mechanism; a History elective; and an Education Psychology elective (see list).
- Quarter 6** 19.135, Personality I; 55.131, Normal Development of Language and Speech; 55.133, Introduction to Linguistics and Phonetics; and an elective.
- Quarter 7** 19.136, Personality II; 55.134, Organic Speech Disorders; a Humanities elective; and an elective.
- Quarter 8** 55.141, Methods and Materials in Speech and Hearing and Articulation Disorders; 55.143, Diagnostic Techniques in Speech and Hearing; 55.145, Functional Speech Disorders; and a Literature elective.
- Quarter 9** 55.142, Introduction to Audiology; 55.144, Clinical Practice in Speech and Hearing I; a Literature elective; and an elective.
- Quarter 10** 55.155, Clinical Practice in Speech and Hearing II; 90.253, Professional Development for Teachers; a Humanities elective; an Education Humanities elective (see list); and an elective.
- Quarter 11** 55.152, Speechreading and Auditory Training; and 55.154, Introduction to Stuttering.

College of Engineering

CHEMICAL ENGINEERING

4.101, Chemical Engineering Calculations I; 10.153, Calculus; 11.206, Physics for Engineering Students IV; 11.110, Physics Laboratory for Engineering Students I; and 12.147, Organic Chemistry.	Quarter 4
2.165, Mechanics I; 4.102, Chemical Engineering Calculations II; 10.154, Calculus; 11.111, Physics Laboratory for Engineering Students II; and 12.148, Organic Chemistry.	Quarter 5
4.111, Chemical Engineering I; 10.155, Mathematical Analysis; 12.161, Physical Chemistry; and 39.125, Economics.	Quarter 6
4.112, Chemical Engineering II; 10.156, Mathematical Analysis; 12.162, Physical Chemistry; and 39.126, Economics.	Quarter 7
4.121, Transport Phenomena I; 4.123, Experimental Methods I; 4.126, Chemical Engineering Thermodynamics; 4.141, Junior Honors Program (elective); and a liberal elective.	Quarter 8
4.122, Transport Phenomena II; 4.124, Experimental Methods II; 4.136, Chemical Engineering Kinetics; 4.141, Junior Honors Program (elective); and a liberal elective.	Quarter 9
4.131, Process Design I or 4.133, Projects I; and two of the following three courses: 4.135, Introduction to Nuclear Engineering, 4.138, Process Control Systems, a technical elective; 90.257, Professional Development for Engineers; and a liberal elective.	Quarter 10
4.132, Process Design II or 4.134, Projects II; a liberal elective; and two of the following three courses: 4.137, Applied Mathematics in Chemical Engineering, 4.124, Introduction to Optimization, 4.850, Chemical Process Pollution Control or a technical elective.	Quarter 11

CIVIL ENGINEERING

1.116, Engineering Measurements and 1.117, Engineering Measurements Laboratory or 1.140, Structural Mechanics I; 10.153, Calculus; 11.110, Physics Laboratory for Engineering Students I; 11.206, Physics for Engineering Students IV; and 39.125, Economics.	Quarter 4
1.116, Engineering Measurements and 1.117, Engineering Measurements Laboratory or 1.140, Structural Mechanics I; 2.130, Thermodynamics I; 10.154, Calculus; 11.111, Physics Laboratory for Engineering Students II; and 39.126, Economics.	Quarter 5
1.141, Structural Mechanics II; 2.116, Dynamics; 10.155, Mathematical Analysis; and a liberal elective.	Quarter 6

- Quarter 7** 1.120, Fluid Mechanics I; 1.142, Structural Mechanics III; 1.180, Materials; 10.156, Mathematical Analysis; and 29.113, Effective Speaking Workshop.
- Quarter 8** 3.183, Electrical Engineering I; 1.150, Concrete Design I or 1.178, Soil Mechanics and 1.179, Soil Mechanics Laboratory; a liberal elective; and one of the following four courses: 1.106, Applied Probability Theory for Civil Engineers, 1.143, Structural Analysis I, 1.175, Engineering Geology, 5.245, Basic Engineering Statistics.
- Quarter 9** 1.193, Environmental Engineering I; 1.178, Soil Mechanics and 1.179, Soil Mechanics Laboratory or 1.150, Concrete Design I; a liberal elective; and one of the following four courses: 1.105, Civil Engineering Systems, 1.143, Structural Analysis I, 1.144, Structural Analysis II, 5.260, Engineering Economy.
- Quarter 10** 1.160, Structural Design I; 90.257, Professional Development for Engineers; a liberal elective; and two of the following courses: 1.101, Special Topics, 1.106, Applied Probability Theory for Civil Engineers, 1.122, Hydraulic Engineering, 1.143, Structural Analysis I, 1.144, Structural Analysis II, 1.152, Concrete Design II, 1.175, Engineering Geology, 1.224, Environmental Chemistry, 5.245, Basic Engineering Statistics.
- Quarter 11** A liberal elective; and three of the following courses: 1.101, Special Topics, 1.105, Civil Engineering Systems, 1.134, Transportation Engineering, 1.135, Construction Engineering, 1.144, Structural Analysis II, 1.145, Structural Analysis III, 1.152, Concrete Design II, 1.161, Structural Design II, 1.174, Foundation Engineering, 1.194, Environmental Engineering II, 1.196, Environmental Laboratory, 1.259, Air Pollution, 5.260, Engineering Economy.

ELECTRICAL ENGINEERING

- Quarter 4** 3.111, Circuits and Systems I; 10.153, Calculus; 11.206, Physics for Engineering Students IV; 11.110, Physics Laboratory for Engineering Students I; and a liberal elective.
- Quarter 5** 3.112, Circuits and Systems II; 10.154, Calculus; 11.207, Elementary Modern Physics; 11.111, Physics Laboratory for Engineering Students II; and a liberal elective.
- Quarter 6** 2.130, Thermodynamics I; 3.113, Circuits and Systems III; 3.131, E.E. Laboratory I - Measurements; 10.155, Mathematical Analysis; and a liberal elective.
- Quarter 7** 2.163, Mechanics for Electrical Engineers; 3.122, Circuits and Systems IV; 3.132, E.E. Laboratory II - Circuits and Systems; 10.156, Mathematical Analysis; and a liberal elective.
- Quarter 8** 2.130, Thermodynamics I; 2.199, Materials Science; 3.141, Electronics I; and 3.161, Electromagnetic Field Theory I.

3.133, E.E. Laboratory III - Devices; 3.142, Electronics II; 3.162, Electromagnetic Field Theory II; a liberal elective; and one of the following four courses: 3.191, Design and Organization of Digital Computers, 3.261, Wave Transmission and Reception, 3.285, Introduction to Theory of Digital Computation, 3.292, Mathematical Techniques in Electrical Engineering I.

Quarter 9

3.134, E.E. Laboratory IV; 3.175, Electromechanical Dynamics; 90.257, Professional Development for Engineers; a liberal elective; and two of the following courses: 3.191, Design and Organization of Digital Computers, 3.218, Control System Theory, 3.221, Electric Power Systems I, 3.233, E.E. Power Laboratory I, 3.237, Senior Project Laboratory I, 3.238, Senior Project Laboratory II, 3.242, Theory and Technology of Semiconductor Devices I, 3.251, Communication Theory, 3.281, Fundamentals of Computation Structures, 3.292, Mathematical Techniques in Electrical Engineering II, 3.295, Numerical Methods, 3.296, Digital Techniques.

Quarter 10

A liberal elective; and two or three of the following courses: 3.144, Electronics III, 3.191, Design and Organization of Digital Computers, 3.222, Electric Power Systems II, 3.234, E.E. Power Laboratory II, 3.327, Senior Project Laboratory I, 3.238, Senior Project Laboratory II, 3.241, Selected Topics in Electronics, 3.243, Theory and Technology of Semiconductor Devices II, 3.251, Communication Theory, 3.261, Wave Transmission and Reception, 3.262, Advanced Topics in Electromagnetic Field Theory, 3.285, Introduction to Theory of Digital Computation, 3.292, Mathematical Techniques in Electrical Engineering I, 3.293, Mathematical Techniques in Electrical Engineering II, 3.296, Digital Techniques.

Quarter 11

ELECTRICAL ENGINEERING

Power Systems

3.111, Circuits and Systems I; 10.153, Calculus; 11.206, Physics for Engineering Students IV; 11.110, Physics Laboratory for Engineering Students I; and a liberal elective.

Quarter 4

3.112, Circuits and Systems II; 10.154, Calculus; 11.207, Elementary Modern Physics; 11.111, Physics Laboratory for Engineering Students II; and a liberal elective.

Quarter 5

2.130, Thermodynamics I; 3.113, Circuits and Systems III; 3.131, E.E. Laboratory I - Measurements; 10.155, Mathematical Analysis; and a liberal elective.

Quarter 6

2.131, Thermodynamics II; 3.122, Circuits and Systems IV; 3.132, E.E. Laboratory II - Circuits and Systems; 10.156, Mathematical Analysis; and a liberal elective.

Quarter 7

3.141, Electronics I; 3.161, Electromagnetic Field Theory I; 3.174, Basic Power Circuits; a liberal elective; and an added elective, 10.8G1, Probability.

Quarter 8

- Quarter 9** 2.163, Mechanics for Electrical Engineers; 3.142, Electronics II; 3.162, Electromagnetic Field Theory II; 3.175, Electromechanical Dynamics; and a liberal elective.
- Quarter 10** 3.176, Machines and Systems; 3.233, E.E. Power Laboratory I; 3.221, Electric Power Systems I; 3.823, Mathematical Methods in Electrical Engineering; 90.257, Professional Development for Engineers; and a liberal elective.
- Quarter 11** 3.222, Electric Power Systems II; 3.234, E.E. Power Laboratory II; 4.146, Introduction to Nuclear Engineering (E.E.); a liberal elective; and one of the following courses: 1.193, Environmental Engineering I, 2.196, Materials Science, 3.191, Design and Organization of Digital Computers, 5.260, Engineering Economy.

GENERAL ENGINEERING PROGRAM

- Quarter 4** 10.153, Calculus; 11.206, Physics for Engineering Students IV; 11.110, Physics Laboratory for Engineering Students I; a liberal elective; and an Engineering Science elective.
- Quarter 5** 10.154, Calculus; 11.111, Physics Laboratory for Engineering Students II; a liberal elective; an Engineering Science elective; and Coordinated Study.
- Quarter 6** A liberal elective; an Engineering Science elective; and Coordinated Studies.
- Quarter 7** A liberal elective; Engineering Science electives; and Coordinated Study.
- Quarter 8** Engineering Science electives; and Coordinated Studies.
- Quarter 9** Engineering Science electives; and Coordinated Studies.
- Quarter 10** Engineering Science electives; and Coordinated Studies.
- Quarter 11** An Engineering Science elective; and Coordinated Studies.

INDUSTRIAL ENGINEERING

- Quarter 4** 5.128, Work Design; 10.153, Calculus; 11.206, Physics for Engineering Students IV; 11.110, Physics Laboratory for Engineering Students I; and 39.115, Principles and Problems of Economics.
- Quarter 5** 5.145, Probabilistic Analysis for Engineers; 10.154, Calculus; 11.111, Physics Laboratory for Engineering Students II; 39.116, Principles and Problems of Economics; and one of the following three courses: 2.130, Thermodynamics I, 2.196, Materials Science 5.201, Principles of Computation and Programming I.

5.147, Statistics I; 29.102, Effective Speaking; a Mathematics elective; and two of the following five courses: 1.124, Flow of Fluids, 2.130, Thermodynamics I, 2.165, Mechanics I, 3.183, Electrical Engineering I, 5.202, Principles of Computation and Programming II.	Quarter 6
5.161, Operations Research I; a liberal elective; a technical elective; and one of the following courses: 2.130, Thermodynamics I, 2.166, Mechanics II, 2.196, Materials Science, 3.184, Electrical Engineering II, 5.201, Principles of Computation and Programming I.	Quarter 7
5.161, Operations Research I; a liberal elective; a technical elective; and one of the following courses: 1.124, Flow of Fluids, 2.130, Thermodynamics I, 2.165, Mechanics I, 3.183, Electrical Engineering I, 5.202, Principles of Computation and Programming II.	Quarter 8
5.163, Operations Research II; 5.130, Systems I; a liberal elective; and one of the following courses: 2.130, Thermodynamics I, 2.166, Mechanics II, 2.196, Materials Science, 3.184, Electrical Engineering.	Quarter 9
5.130, Systems I; 5.186, People in Organizations; 5.190, Senior Project; 90.257, Professional Development for Engineers; an Industrial Engineering elective; and a non-Engineering elective.	Quarter 10
5.131, Systems II; a non-Engineering elective; and Engineering electives.	Quarter 11

MECHANICAL ENGINEERING

2.165, Mechanics I; 10.153, Calculus; 11.206, Physics for Engineering Students IV; 11.110, Physics Laboratory for Engineering Students I; and 39.115, Principles and Problems of Economics.	Quarter 4
2.166, Mechanics II; 10.154, Calculus; 2.130, Thermodynamics I; 11.111, Physics Laboratory for Engineering Students II; and a liberal elective.	Quarter 5
2.167, Mechanics III; 2.131, Thermodynamics II; 2.192, Measurement and Analysis; and 10.155, Mathematical Analysis.	Quarter 6
2.155, Fluid Mechanics I; 2.196, Materials Science; 10.156, Mathematical Analysis; and a liberal elective.	Quarter 7
Three electives; and a liberal elective.	Quarter 8
Three electives; and a elective.	Quarter 9
90.257, Professional Development for Engineers; three electives; and a liberal elective.	Quarter 10
Three electives; and a liberal elective.	Quarter 11

MECHANICAL ENGINEERING - Five-Year B.S. - M.S.

Quarter 6	2.131, Thermodynamics II; 2.167, Mechanics III; 2.192, Measurement and Analysis; 10.155, Mathematical Analysis; and a liberal elective.
Quarter 7	2.155, Fluid Mechanics I; 2.196, Materials Science; 10.156, Mathematical Analysis; and two liberal electives.
Quarter 8	2.826, Mathematical Methods for Mechanical Engineers I; three electives; a liberal elective; and a graduate elective.
Quarter 9	2.827, Mathematical Methods for Mechanical Engineers II; three electives; a liberal elective; and a graduate elective.
Quarter 10A	Graduate electives (8 Q.H.); electives (8 Q.H.); and a seminar.
Quarter 11S	Graduate electives (8 Q.H.); electives (8 Q.H.); and a seminar.
Quarter 12	Graduate electives (4 Q.H.); electives (8 Q.H.); and a thesis.

ENGINEERING TRANSFER PROGRAM

TRANSFER STUDENTS

Special Term

Quarter 5T All engineering transfer students take: 9.104, Computer Programming; 10.140, Mathematical Analysis IV-V; 11.126, Physics Review; Civils add: 1.140, Structural Mechanics I; Mechanicals add: 2.164, Mechanics; Electricals add: 3.119, Circuits and Systems A; Chemicals add: 4.103, Chemical Engineering Calculations - Transfers; and Industrials add: 10.208, Probability.

Special Term

Quarter 6T Civils take: 1.141, Structural Mechanics II; 2.116, Dynamics; 2.130, Thermodynamics I; and 10.155, Mathematical Analysis. Electricals take: 2.130, Thermodynamics I; 3.120, Circuits and Systems B; 10.155 Mathematical Analysis; and a liberal elective.

Lincoln College

B.E.T. ELECTRICAL

10.421, Calculus A; 3.451, Circuit Analysis I; 11.420, Physics Iv (Electromagnetic Field); and a liberal elective.	Quarter 4
3.324, Circuits Laboratory I; 3.440, Physical Electronics; 3.452, Circuit Analysis II; 10.422, Calculus B; and a liberal elective.	Quarter 5
3.311, Electronics I; 3.325, Circuits Laboratory II; 3.453, Circuits Analysis III; 3.460, Engineering Analysis; and 39.105, Principles of Economics.	Quarter 6
3.312, Electronics II; 3.323, Electronic Laboratory; 3.410, Electrical Measurements; 3.430, Energy Conversion; and 3.454, Circuits Analysis IV.	Quarter 7

B.E.T. MECHANICAL

10.421, Calculus A; 2.411, Mechanics A; 9.454, Production Drawing; and 2.461, Machine Shop or a liberal elective.	Quarter 4
2.414, Stress Analysis A; 2.431, Materials A; 2.412, Mechanics B; and 10.422, Calculus B.	Quarter 5
2.415, Stress Analysis B; 2.421, Thermodynamics A; 2.462, Mechanical Technology Laboratory I; 2.413, Mechanics C; and 39.116, Principles and Problems of Economics.	Quarter 6
2.422, Thermodynamics B; 2.465, Heat Technology Laboratory I; 2.441, Fluid Mechanics A; and 3.420, Electricity and Electronics I.	Quarter 7

College of Liberal Arts

ART HISTORY

Quarter 4	27.118, History of Art I; a History elective; and two electives.
Quarter 5	27.119, History of Art II; a History elective; and two electives.
Quarter 6	Two Art History electives; and two electives.
Quarter 7	Two Art History electives; and two electives.
Quarter 8	Two Art History electives; and two electives.
Quarter 9	Two Art History electives; and two electives.
Quarter 10	Two Art History electives; and two electives.
Quarter 11	Two Art History electives; and two electives.

BIOLOGY

Quarter 4	12.144, Organic Chemistry; 18.133, Plant Biology; 10.106, Calculus or an elective; a Modern Language or an elective.
Quarter 5	12.145, Organic Chemistry; 18.134, Environment and Population Biology; 10.107, Calculus or an elective; a Modern Language or an elective.
Quarter 6	18.135, Genetics and Development Biology; 11.117, Physics for Science Majors and 11.124, Physics Laboratory for Science Majors, or 11.171, Physics for the Life Sciences I and 11.173, Physics Laboratory for the Life Sciences I; and two electives.
Quarter 7	18.136, Cell Biology; 11.119, Physics for the Science Majors III and 11.125, Physics Laboratory for Science Majors II, or 11.172, Physics for the Life Sciences II and 11.174, Physics Laboratory for the Life Sciences II; and two electives.
Quarter 8	A Biology elective; and three electives.
Quarter 9	A Biology elective; and three electives.
Quarter 10	A Biology elective; and three electives.
Quarter 11	A Biology elective; and three electives.

CHEMISTRY

Quarter 4	11.124, Physics Laboratory for Science Majors; 11.118, Physics for Science Majors II; 12.153, Organic Chemistry; 33.115, Intermediate German or 34.115, Intermediate Russian; and an elective.
Quarter 5	10.207, Differential Equations; 11.125, Physics Laboratory for Science Majors II; 11.119, Physics for Science Majors III; 12.154, Organic Chemistry; 33.116, Intermediate German or 34.116, Intermediate Russian.

12.155, Organic Chemistry; 12.166, Physical Chemistry; and two electives.	Quarter 6
12.169, Physical Chemistry; 12.200, Principles of Experimental Chemistry; 12.201, Integrated Chemistry Laboratory I; 12.185, Inorganic Chemistry; and two electives.	Quarter 7
12.170, Physical Chemistry; 12.181, Instrumental Analysis; 12.202, Integrated Chemistry Laboratory I; and two electives.	Quarter 8
12.213, Advanced Inorganic Chemistry; 12.253, Identification of Organic Compounds; an advanced science or Mathematics elective; and an elective.	Quarter 9
A Mathematics elective or an advanced science elective; undergraduate research or advanced laboratory; and two electives.	Quarter 10
Four electives.	Quarter 11

DRAMA

29.150, Elementary Acting I; 29.170, Scenic Production; 19.105, Foundations of Psychology I or 20.100, Principles of Social Anthropology; a Modern Language or an elective; and Physical Education.	Quarter 4
29.110, Voice and Articulation; 19.106, Foundations of Psychology II or 21.100, Introduction to Sociology; Modern Language or an elective; Physical Education; and a Drama elective.	Quarter 5
29.209, Speech for the Theatre or an elective; a Drama elective; Physical Education; and two electives.	Quarter 6
Two Drama electives; Physical Education; and two electives.	Quarter 7
29.106, Concepts of Direction or an elective; 29.200, History of the Theatre; a Drama elective; Physical Education; and an elective.	Quarter 8
29.201, History of the Theatre; a Drama elective; Physical Education; and two electives.	Quarter 9
Two Drama electives; Physical Education; and two electives.	Quarter 10
Two Drama electives; Physical Education; and two electives.	Quarter 11

ECONOMICS

10.104, Fundamentals of Mathematics; 39.115, Principles and Problems of Economics; a Modern Language or an elective; and a Social Science elective.	Quarter 4
10.105, Fundamentals of Mathematics; 39.116, Principles and Problems of Economics; a Modern Language or an elective; and a Social Science elective.	Quarter 5
39.250, Statistics I; 39.255, Microeconomic Theory; a Social Science elective; and an elective.	Quarter 6
39.251, Statistics II; 39.256, Macroeconomic Theory; 19.106, Foundations of Psychology II or a Social Science elective; and an elective.	Quarter 7

- Quarter 8** Economics electives; and electives.
- Quarter 9** Economics electives; and electives.
- Quarter 10** Economics electives; and electives.
- Quarter 11** 39.293, Introduction to Econometrics or 39.294, Problems in Economic Research; and three electives;
OR
Two Economics electives; and two electives.

ENGLISH

- Quarter 4** 23.130, England to 1688 (Group A); 30.170, Survey of English Literature; a Modern Language or an elective; and an elective.
- Quarter 5** 23.131, England since 1688 (Group B); 30.171, Survey of English Literature; a Modern Language or an elective; and an elective.
- Quarter 6** 30.110, Literary Analysis: Poetry; an American Literature elective; and two electives.
- Quarter 7** 30.121, Foundations of the English Language; an American Literature elective; and two electives.
- Quarter 8** 30.222, Chaucer or a Medieval Literature elective; an English elective; and two electives.
- Quarter 9** 30.251, Shakespeare or another Shakespeare elective; an English elective; and two electives.
- Quarter 10** An English seminar; an Eighteenth-Century Literature elective; and two electives.
- Quarter 11** A Nineteenth-Century Literature elective; and three electives.

GEOLOGY

- Quarter 4** 10.106, Calculus or an elective; 16.211, Descriptive Mineralogy; a Physics elective; a Modern Language or an elective.
- Quarter 5** 10.107, Calculus or an elective; 16.212, Optical Crystallography; a Physics elective; a Modern Language or an elective.
- Quarter 6** Two Geology electives; a Physics elective; and an elective.
- Quarter 7** Two Geology electives; and two electives.
- Quarter 8** Two Geology electives; and two electives.
- Quarter 9** A Geology elective; and three electives.
- Quarter 10** A Geology elective; and three electives.
- Quarter 11** 16.271, Geology seminar; and three electives.

HISTORY

- Quarter 4** 23.210, The United States to 1877; a Modern Language or an elective; and two electives.

23.211, The United States since 1877; a Modern Language or an elective; and two electives.	Quarter 5
23.199, The Historian's Craft; a History elective; and two electives.	Quarter 6
Two History electives; and two electives.	Quarter 7
Two History electives; and two electives.	Quarter 8
Two History electives; and two electives.	Quarter 9
Two History electives; and two electives.	Quarter 10
A History elective; and three electives.	Quarter 11

JOURNALISM

23.210, The United States to 1877; 38.103, Fundamentals of Newswriting; a Modern Language or an elective; and one of the following three courses: 20.100, Principles of Social Anthropology, 26.101, Introduction to Philosophy I, 39.115, Principles and Problems of Economics.	Quarter 4
23.211, The United States since 1877; 38.104, Fundamentals of Newswriting; a Modern Language or an elective; and one of the following three courses: 21.100, Introduction to Sociology, 26.102, Introduction to Philosophy II, 39.116, Principles and Problems of Economics or a Math/Science elective.	Quarter 5
30.171, Survey of English Literature; 38.106, Techniques of Journalism; a History elective or a Math/Science elective; and an elective.	Quarter 7
38.101, History and Principles of Journalism; a Political Science elective or a Math/Science elective; and two electives.	Quarter 8
38.102, History and Principles of Journalism; a Political Science elective or a Math/Science elective; and two electives.	Quarter 9
38.107, The Press and Society or 38.130, Advanced Reporting; an English elective; and two electives.	Quarter 10
38.108, The Press and Society or 38.130, Advanced Reporting; an English elective; and two electives.	Quarter 11

MATHEMATICS

10.184, Calculus and Linear Methods I; 10.186, Differential Equations and Linear Methods I; a Modern Language or an elective; and an elective.	Quarter 4
10.185, Calculus and Linear Methods II; 10.187, Differential Equations and Linear Methods II; a Modern Language or an elective; and an elective.	Quarter 5
10.246, Advanced Linear Algebra I; 10.250, Analysis I; and two electives.	Quarter 6
10.247, Advanced Linear Algebra II; 10.251, Analysis II; and two electives.	Quarter 7
Two Mathematics electives; and two electives.	Quarter 8

- Quarter 9** Two Mathematics electives; and two electives.
Quarter 10 Two Mathematics electives; and two electives.
Quarter 11 Two Mathematics electives; and two electives.

MODERN LANGUAGES

- Quarter 4** 30.170, Survey of English Literature; a History elective; a Modern Language or an elective; and an elective.
Quarter 5 30.171, Survey of English Literature; a History elective; a Modern Language or an elective; and an elective.
Quarter 6 Two Language electives; and two electives.
Quarter 7 Two Language electives; and two electives.
Quarter 8 Two Language electives; and two electives.
Quarter 9 Two Language electives; and two electives.
Quarter 10 Two Language electives; and two electives.
Quarter 11 Two Language electives; and two electives.

PHILOSOPHY

- Quarter 4** 26.110, History of Ancient Philosophy; a Modern Language or an elective; and two electives.
Quarter 5 26.111, History of Modern Philosophy; a Modern Language or an elective; and two electives.
Quarter 6 26.150, Introduction to Logic or 26.151, Symbolic Logic; a Philosophy elective; and two electives.
Quarter 7 A Philosophy elective; and three electives.
Quarter 8 Two Philosophy electives; and two electives.
Quarter 9 26.155, Moral Philosophy; and two electives.
Quarter 10 A Philosophy seminar; a Philosophy elective; and two electives.
Quarter 11 Two Philosophy electives; and two electives.

PHYSICS

- Quarter 4** 10.184, Calculus and Linear Methods I; 11.124, Physics Laboratory for Science Majors; 11.127, Physics for Science Majors IV; and two electives.
Quarter 5 10.185, Calculus and Linear Methods II or 10.207, Differential Equations; 11.125, Physics Laboratory for Science Majors II; 11.128, Physics for Science Majors V; and two electives.
Quarter 6 11.200, Intermediate Mechanics; 11.220, Thermodynamics and Kinetic Theory; 11.260, Wave Laboratory; 10.221, Applied Analysis or 10.250, Analysis I; and an elective.

11.208, Mathematical Physics; 11.221, Wave Motion and Optics; 11.271, Electronics Laboratory; 10.222, Applied Analysis or 10.251, Analysis II or an elective.	Quarter 7
11.220, Thermodynamics and Kinetic Theory; 11.230, Modern Physics; 11.271, Electronics Laboratory; 11.272, Experimental Laboratory; and two electives.	Quarter 8
11.208, Mathematical Physics; and three electives.	Quarter 9
11.211, Electricity and Magnetism I; 11.272, Experimental Laboratory; 11.240, Quantum Mechanics I; and three electives.	Quarter 10
11.212, Electricity and Magnetism II; 11.241, Quantum Mechanics II; 11.273, Advanced Physics Laboratory; and an elective.	Quarter 11

POLITICAL SCIENCE

22.151, Comparative Government; a Modern Language or an elective; and two Social Science electives.	Quarter 4
A Political Science elective; two Social Science electives; and a Modern Language or an elective.	Quarter 5
22.221, International Relations; 22.280, Research Methods in Political Science or a Social Science elective; and two electives.	Quarter 6
A Political Science elective; a Social Science elective; and two electives.	Quarter 7
22.281, Quantitative Methods or a Political Science elective; 22.270, Political Theory or 22.273, Political Thought I; and two electives.	Quarter 8
22.261, Public Administration; 22.286, Research Seminar or a Political Science elective; and two electives.	Quarter 9
A Political Science elective; and three electives.	Quarter 10
A Political Science elective; and three electives.	Quarter 11

PSYCHOLOGY

19.120, Statistics in Psychology I; a Psychology elective; and two electives.	Quarter 4
19.121, Statistics in Psychology II; 19.160, Experimental Psychology I or 19.164, Learning and Motivation; a Psychology elective; and an elective.	Quarter 5
19.164, Learning and Motivation or 19.160, Experimental Psychology I; a Psychology elective; an elective from Chemistry, Biology, or Physics; and an elective.	Quarter 6
19.161, Experimental Psychology II or 19.163, Psychology of Learning or 19.165, Learning Laboratory; a Psychology elective; an elective from Chemistry, Biology, or Physics; and an elective.	Quarter 7
A Psychology elective; an Experimental Psychology elective; and two electives.	Quarter 8

- Quarter 9** A Psychology elective; and three electives.
- Quarter 10** Four electives.
- Quarter 11** A Psychology elective; and three electives.

SOCIOLOGY-ANTHROPOLOGY

- Quarter 4** 21.239, Introduction to Statistical Analysis; 21.280, Social Theory I; an Introductory course in Sociology, Anthropology, Economics, Political Science or Psychology; and an elective.
- Quarter 5** 21.281, Social Theory II; 21.239, Introduction to Statistical Analysis or an elective; a Modern Language or an elective; and an Introductory course in Sociology, Anthropology, Economics, Political Science or Psychology.
- Quarter 6** 21.111, American Society; 21.240, Research Methods I; 21.101, Principles of Sociology or an elective; an Anthropology elective or a Sociology elective.
- Quarter 7** 21.241, Research Methods II; an Anthropology elective or a Sociology elective; and two electives.
- Quarter 8** Two Sociology or Anthropology electives; and two electives.
- Quarter 9** A Sociology or Anthropology elective; and two electives.
- Quarter 10** A Sociology or Anthropology elective; and three electives.
- Quarter 11** A Sociology or Anthropology elective; and three electives.

College of
Nursing

ASSOCIATE DEGREE
PROGRAM

19.201, Psychology of Abnormal Behavior; and 81.101, Medical-Surgical Nursing or 82.101, Maternal and Child Health.	Quarter 4
21.100, Introduction to Sociology; and 81.101, Medical-Surgical Nursing or 82.101, Maternal and Child Health.	Quarter 5
30.114, Introduction to Literature; 90.254, Professional Development for Nurses; 81.102, Medical-Surgical Nursing or 83.101, Psychiatric Nursing; and an elective.	Quarter 6
22.177, American Political Process; 81.102, Medical-Surgical Nursing or 83.101, Psychiatric Nursing; and an elective.	Quarter 7

LICENSED
PRACTICAL NURSING

21.100, Introduction to Sociology; 22.177, American Political Process; 81.102, Medical-Surgical Nursing or 82.101, Maternal and Child Health; and an elective.	Quarter 4S
30.114, Introduction to Literature; 83.101, Psychiatric Nursing; 90.254, Professional Development for Nurses; and an elective.	Quarter 4
30.114, Introduction to Literature; 83.101, Psychiatric Nursing; 90.254, Professional Development for Nurses; a History elective; and an optional elective.	Quarter 5S
82.101, Maternal and Child Health; 22.177, American Political Process; and 21.100, Introduction to Sociology or an elective.	Quarter 5
81.102, Medical-Surgical Nursing or 82.101, Maternal and Child Health; 21.100, Introduction to Sociology or an elective; and an elective.	Quarter 6S

BACHELOR'S DEGREE
PROGRAM

18.120, Basic Microbiology; 18.125, Human Physiology; 19.105, Foundations of Psychology I; and 80.204, Nursing - Universal Needs.	Quarter 4
18.126, Human Physiology; 19.106, Foundations of Psychology II; 20.100, Principles of Social Anthropology; and 80.205, Nursing - Common Problems I.	Quarter 5
19.141, Growth and Development I; 21.100, Introduction to Sociology; and 80.206, Nursing - Common Problems II.	Quarter 6

- Quarter 7** 19.130, Social Psychology; 19.142, Growth and Development II; 81.201, Medical-Surgical Nursing or 82.201, Maternal and Child Health or 83.201, Psychiatric-Mental Health Nursing.
- Quarter 8** 81.201, Medical-Surgical Nursing or 82.201, Maternal and Child Health or 83.201, Psychiatric-Mental Health Nursing; a Humanities elective; and an elective.
- Quarter 9** 81.201, Medical-Surgical Nursing or 82.201, Maternal and Child Health or 83.201, Psychiatric-Mental Health Nursing; a Humanities elective; and an elective.
- Quarter 10** 84.201, Public Health Nursing; and two electives.
- Quarter 11** 85.201, Contemporary Nursing; and an elective.

**College of
Pharmacy
and
Allied Health
Professions**

PHARMACY

12.144, Organic Chemistry; 11.171, Physics for the Life Sciences I; 19.105, Foundations of Psychology I; 39.115, Principles and Problems of Economics.	Quarter 4
12.145, Organic Chemistry; 11.175, Physics for the Life Sciences III; 21.100, Introduction to Sociology; 29.108, Business and Professional Speaking.	Quarter 5
71.261, Pharmacy I; 73.203, Anatomy-Physiology; 93.151, General Biochemistry; and an elective.	Quarter 6
18.120, Basic Microbiology; 71.262, Pharmacy II; 72.241, Introduction to Therapeutics; and 73.204, Anatomy-Physiology.	Quarter 6A
72.230, Drug Analysis; 72.242, Chemical Pharmacology I; 73.223, Clinical Biochemistry; and an elective.	Quarter 7
71.263, Pharmacy III; 73.245, Introduction to Pathology; 72.243, Chemical Pharmacology II; and a professional elective.	Quarter 8
71.264, Pharmacy IV; 72.244, Chemical Pharmacology III; 73.247, Toxicology; and a professional elective.	Quarter 9
65.218, Public Health; 71.265, Professional Practice I; 72.243, Chemical Pharmacology II; and a professional elective.	Quarter 10
71.245, Pharmacy Administration I; 71.266, Professional Practice II; 72.244, Chemical Pharmacology III; 90.251, Placement Techniques; and a professional elective.	Quarter 10A
71.253, Clinical Pharmacy; 71.267, Professional Practice III; and a professional elective.	Quarter 11

**FORSYTH DENTAL -
ASSOCIATE DEGREE PROGRAM**

30.113, Freshman Writing.	Quarter 4
30.114, Introduction to Literature.	Quarter 4A
21.100, Introduction to Sociology.	Quarter 5

MEDICAL LABORATORY SCIENCE

- Quarter 4** All take 12.144, Organic Chemistry; 18.158, Vertebrate Physiology; and a Modern Language or a Humanities elective; option I add a Social Science elective; option II add 87.102, Basic Medical Laboratory Hematology, 87.103, Basic Medical Laboratory Immunohematology, and 18.120, Basic Microbiology or 87.101, Basic Medical Laboratory Science.
- Quarter 5** All take 12.145, Organic Chemistry; 18.159, Vertebrate Physiology; a Modern Language or a Humanities elective; option I add 87.105, Basic Medical Laboratory Chemistry and Instrumentation; option II add 12.171, Analytical Chemistry or an elective.
- Quarter 6** All take 18.135, Genetics and Development Biology; 11.117, Physics for Science Majors and 11.124, Physics Laboratory for Science Majors or 11.171, Physics for the Life Sciences I and 11.173, Physics Laboratory for the Life Sciences I; 87.102, Basic Medical Laboratory Hematology; 87.103, Basic Medical Laboratory Immunohematology; option I add a Social Science elective, a Humanities elective or 12.171, Analytical Chemistry, and an optional elective; option II add 18.120, Basic Microbiology, 87.120, Communications in the Health Sciences or a Speech elective, a Humanities elective, and an optional elective.
- Quarter 7** 11.119, Physics for Science Majors III and 11.125, Physics Laboratory for Science Majors II or 11.172, Physics for the Life Sciences II and 11.174, Physics Laboratory for the Life Sciences II; 18.136, Cell Biology; option I add one elective and a Social Science elective; option II add a Humanities elective, 18.220, General Microbiology or 87.120, Communications in the Health Sciences or a Speech elective.
- Quarter 8** 18.158, Vertebrate Physiology; 12.171, Analytical Chemistry or an elective; 87.101, Basic Medical Laboratory Science; 87.102, Basic Medical Laboratory Hematology or 87.103, Basic Medical Laboratory Immunohematology or a Humanities elective; 87.126, Physiology or a Biology elective; and a Social Science elective.
- Quarter 9** 12.171, Analytical Chemistry; 18.159, Vertebrate Physiology; 18.220, General Microbiology; 87.120, Communications in the Health Sciences or a Speech elective; 87.126, Physiology; 87.105, Basic Medical Laboratory Chemistry and Instrumentation; and an elective.
- Quarter 10** 87.112, Hematology and Immunohematology Applied Study (at Hospital); 87.202, Hematology and Immunohematology; 87.190, undergraduate research; and 87.203, Medical Immunology and Serology;
OR
87.115, Medical Laboratory Chemistry Applied Study (at Hospital); 87.204, Medical Parasitology; 87.205, Clinical Chemistry; and 87.226, Medical Laboratory Science Education.
- Quarter 11** 87.111, Medical Microbiology Applied Study (at Hospital); 87.121, Quality Control; 87.201, Pathogenic Microbiology; and 87.221, Medical Laboratory Management.

MEDICAL RECORD ADMINISTRATION

8.114, Functional Human Anatomy I; 21.100, Introduction to Sociology; 23.101, Western Civilization or 39.115, Principles and Problems of Economics; and a Modern Language or an elective.	Quarter 4
8.115, Functional Human Anatomy II; 18.120, Basic Microbiology; 21.101, Introduction to Sociology or a Modern Language or an elective; and 23.102, Western Civilization or 39.116, Principles and Problems of Economics.	Quarter 5
3.111, Drugs - Uses and Actions; 86.107, Medical Terminology; 86.112, Foundations of Medical Science I; 29.100, Public Speaking and an elective.	Quarter 6
6.102, Hospital Law; 86.113, Foundations of Medical Science II; 86.151, Medical Record Science I; and an elective.	Quarter 7
5.209, Organizational Behavior I; 86.152, Medical Record Science I; 86.252, Applied Medical Record Science - Directed Study I; and statistics; and an elective.	Quarter 8
5.210, Organizational Behavior II; 86.153, Medical Record Science II; 86.253, Applied Medical Record Science - Directed Study II; and an elective.	Quarter 9
6.154, Medical Record Science IV; 86.155, Organization and Management - Medical Record Department; 86.254, Applied Medical Record Science; 86.157, Seminar in Medical Records; and Introduction to Computers.	Quarter 10
6.156, Organization and Management - Medical Record Department; 45.261, Interpersonal Relations; Medical Computer Applications; 87.226, Health Science Education; and Hospital Organization and Management.	Quarter 11

RESPIRATORY THERAPY

3.111, Drugs - Use and Actions; 86.112, Foundations of Medical Science I; 86.184, Procedures of Respiratory Therapy I; 86.284, Directed Applied Study - Respiratory Therapy I.	Quarter 4
6.113, Foundations of Medical Science II; 86.185, Procedures of Respiratory Therapy II; 86.285, Directed Applied Study - Respiratory Therapy II; and a liberal elective.	Quarter 5
6.174, Health, Disease, and Disability I; 86.197, Procedures in Respiratory Therapy IV; 86.511, Personal and Community Health; and an elective.	Quarter 6
6.175, Health, Disease, and Disability II; 86.198, Procedures in Respiratory Therapy V; 86.524, Methods and Materials in Public Health Education; and an elective.	Quarter 7

Course Numbering Program

The number to the left of the decimal point indicates the academic department offering the course. The three digits after the decimal point differentiate the courses within the department.

Accounting	41.	History	23.
Afro-American Studies	25.	Industrial Engineering	05.
Allied Health Professions	86.-87.	Interdisciplinary	93.
Anthropology	20.	International Business	
Art	27.	Administration	46.
Biology	18.	Italian	35.
Business General	49.	Journalism	38.
Chemical Engineering	04.	Latin	36.
Chemistry	12.	Management	45.
Civil Engineering	01.	Marketing	43.
Cooperative	90.	Mathematics	10.
Criminal Justice	92.	Mechanical Engineeringg	02.
Drama and Speech	29.	Military Science	91.
Earth Sciences (Geology)	16.	Music	28.
Economics	39.	Nursing	80.-84.
Education Foundation	50.	Pharmacy	71.-73.
Education Instruction	51.	Philosophy & Religion	26.
Education Reading	54.	Physical Education	60.-62.
Education Speech and		Physical Therapy	64.
Hearing	55.	Physics	11.
Electrical Engineering	03.	Pol. Sci.	22.
English	30.	Psychology	19.
Finance and Insurance	44.	Recreation	63.
French	31.	Russian	34.
German	33.	Small Business Management	47.
Graphic Science	09.	Sociology	21.
Health Education	65.	Spanish	32.
		Transportation	48.

Classes at Northeastern University are scheduled in different modules.

In assessing quarter hour weights for courses, the following statement applies:

One quarter hour of credit is equal to 50 minutes of instruction per week, plus two hours of preparation.

Civil Engineering

01.101 Special Topics (Prereq. outstanding academic performance) 4 Q.H.
 An individual effort in an area within the field of civil engineering selected by the student and adviser with approval by the Department, resulting in a definitive report. Work to be performed in both Quarters 10 and 11, equivalent to 2 qtr. hrs. each quarter. Final grade to be awarded in Quarter 11.
 Staff Fall, Winter, Spring Qtrs.

01.105 Civil Engineering Systems (Prereq. 10.154) 4 Q.H.
 Introduction to system synthesis and optimization techniques. The course is designed primarily for civil engineering students interested in planning and management in the fields of construction, transportation, environmental and structural engineering. Topics include calculus method, linear programming, network analysis, critical path scheduling, and dynamic programming.
 Profs. Ossenbruggen and Scranton Fall and Winter Qtrs.

01.106 Applied Probability Theory for Civil Engineers (Prereq. 10.154) 4 Q.H.
 The basic elements of probability theory and their use via the solution of various civil

engineering problems encountered in fluid mechanics, construction management, structures, transportation, etc. Probability of events, random variables and distribution, derived distribution, expectation, and common probability models.

Prof. Ossenbruggen

Spring and Summer Qtrs.

01.116 Engineering Measurements

4 Q.H.

The methods and instruments utilized to perform engineering measurements; errors and reliability; propagation of errors in computing; application to problems of land surveying, route surveying, and topographical, hydrographical and construction surveys.

Profs. Meserve, Lenney, and Alberti

Fall and Summer Qtrs.

01.117 Engineering Measurements Laboratory

2 Q.H.*

To be taken simultaneously with 01.116. Fieldwork problems to expand and reinforce the lecture material of 01.116.

01.120 Fluid Mechanics I

(Prereq. 1.140) 4 Q.H.

Fluid properties; fluid statics; flow concepts including conservation of mass, energy and momentum; closed conduct flow including friction; dimensional analysis; introduction to open-channel flow.

Profs. Branagan, Horn, and Lenney

Spring and Summer Qtrs.

01.122 Hydraulic Engineering

(Prereq. 01.193) 4 Q.H.

Principles of hydrology, hydraulics of open-channel flow, design of water distribution systems, design of sanitary sewer and storm drainage systems, hydraulic machinery.

Profs. Branagan, Horn, and Meserve

Fall and Winter Qtrs.

01.124 Flow of Fluids

(Prereq. 02.165) 4 Q.H.

Fluid properties, fluid states, closed conduit flow, dimensional analysis, water distribution systems, open-channel flow, and introduction to sanitary sewer design.

Profs. Horn, Lenney, and Cahoon

Fall and Winter Qtrs.

01.134 Transportation Engineering

(Prereq. 01.105) 4 Q.H.

The current technology and status of the various systems of transportation of people and materials, including highways, urban mass transit, railroads, air and water transport, conveyors and pipelines. Civil engineering considerations of planning, design, cost, construction, research needs, and environmental factors.

Profs. Ossenbruggen and Scranton

Spring and Summer Qtrs.

01.135 Construction Engineering

4 Q.H.

Organizational concepts of construction entities; interrelationship of engineer, architect, and contractor; cost management systems; planning and analysis of estimates; scheduling work utilizing computer methods; management and supervision of construction operations; quality control.

Profs. Neff and Leet

Spring Qtr.

01.140 Structural Mechanics I

(Prereq. Freshman Physics) 4 Q.H.

Statics of particles and rigid bodies in two and three dimensions. Analysis of internal forces in trusses and beams. Centroids and centers of gravity of lines, area, and volumes. Moments of inertia of areas and masses.

Profs. Lenney, Namyet, and Woelfl

Winter and Spring Qtrs.

01.141 Structural Mechanics II

(Prereq. 1.140) 4 Q.H.

Review of statics. Shear and bending moment diagrams. Mechanical properties of materials. Analysis of members subjected to torsion and axial loads. Analysis of beams in shear and bending; elastic and plastic theory. Compound stresses.

Profs. Lenney, Namyet, and Woelfl

Fall and Winter Qtrs.

01.142 Structural Mechanics III

(Prereq. 01.141) 4 Q.H.

Transformation of stress and strain. Column buckling and theories of failure. Review of forces in beams and trusses. Influence lines for statically determinate structures. Deflection of trusses, beams, and frames. Utilizing the method of virtual work and moment-area propositions.

Profs. Lenney, Namyet, and Leet

Spring and Summer Qtrs.

*Including lab.

- 01.143 Structural Analysis I** (Prereq. 01.142) 4 Q.H.
Analysis of statically indeterminate structures utilizing the slope-deflection equations and moment-distribution. The system approach to flexibility using matrix notation is also treated.
Profs. Khetarpal, Spencer, and Scranton All Quarters
- 01.144 Structural Analysis II** (Prereq. 01.143) 4 Q.H.
The analysis of all classes of structures by use of the system approach in stiffness and member approach encompassing both flexibility and stiffness completes the matrix analysis of structures. Influence lines for statically indeterminate structures.
Profs. Lenney and Scranton All Quarters
- 01.145 Structural Analysis III** (Prereq. 01.144) 4 Q.H.
Approximate methods of structural analysis. Analysis of cables. Elementary structural dynamics. Analysis of membranes and shells. Structures in architecture.
Profs. Namyet, Lenney, and Leet Spring Qtr.
- 01.150 Concrete Design I** (Prereq. 1.141) 4 Q.H.
Design of reinforced concrete elements by the working stress and ultimate strength methods; bending members and short columns.
Profs. Khetarpal, Leet, and Namyet Spring and Summer Qtrs.
- 01.152 Concrete Design II** (Prereq. 1.150) 4 Q.H.
Design of reinforced concrete structural systems including continuous beams, frames, floors, and roofs. Prestressed concrete design theory and practice. Long columns of reinforced concrete.
Profs. Khetarpal and Leet Fall and Winter Qtrs.
- 01.160 Structural Design I** (Prereq. 1.141) 4 Q.H.
Design of steel members subjected to tension, compression, bending, and combinations of loading. Introduction to plastic analysis and design. Design of connections, braced frames, and rigid frames.
Profs. Cahoon, Namyet, and Leet Fall and Winter Qtrs.
- 01.161 Structural Design II** (Prereq. 1.160) 4 Q.H.
Design of steel plate girders, bridges, composite construction in bridges and buildings. Additional types in plastic analysis and design. Design for lateral loads on high-rise buildings.
Profs. Cahoon and Leet Spring Qtr.
- 01.174 Foundation Engineering** (Prereq. 01.178, 01.179) 4 Q.H.
Evaluation of site survey and boring data for foundations. Determination of soil bearing capacity, design of spread footings, pile and caissons foundations. Design of retaining walls and braced sheeting. Selected topics on settlements and slope stability.
Profs. Jaworski and Leet Spring Qtr.
- 01.175 Engineering Geology** (Prereq. 1.180) 4 Q.H.
Origin and composition of the earth's crust, identification of soil classes, engineering properties of soils, clay and rock mineralogy, geological mapping and exploration, earth movements, weathering, transportation of materials by wind and water.
Profs. Jaworski and Horn Fall and Winter Qtrs.
- 01.178 Soil Mechanics** (Prereq. 1.141) 4 Q.H.
Soil classification, soil-water phase relationships. Introduction to ground water seepage, consolidation theory, strength properties of soils, stress distributions in soils due to surface loads, lateral earth pressures, bearing capacity of shallow footings. Laboratory tests to identify soils, to determine physical properties and soil behavior.
Prof. Jaworski Fall and Winter Qtrs.
- 01.179 Soil Mechanics Laboratory** 2 Q.H.*
To be taken simultaneously with 01.178. Laboratory exercises in soil classification, seepage, shear strength, consolidation, and triaxial testing.
- 01.180 Materials** (Prereq. Freshman Chemistry) 4 Q.H.
The fundamentals of the behavioral classification of materials, such as metals, polymer, colloids, glasses, and composites. Other topics will include the significance of phase

*Including lab.

transformations, visco-elastic behavior, and corrosion mechanisms.

Profs. Gregory and Woelfl

Spring and Summer Qtrs.

01.182 Experimental Methods in Engineering Mechanics

(Prereq. 1.141) 4 Q.H.*

Survey of experimental techniques and instrumentation; experimental determination of basic material properties for concrete, wood, metals, and other engineering materials. Introduction to model analysis.

Prof. Woelfl and Mr. Alberti

Spring and Summer Qtrs.

01.193 Environmental Engineering I

(Prereq. 01.122) 4 Q.H.

An introduction to the nature and effects of environmental quality, including water quality, water supply, water and wastewater treatment, air pollution, and solid waste management, team-taught by various members of the staff lecturing in their specialized areas. Interrelationships between the air-water-land complex are developed. The course emphasizes the engineering approach to the management of the environment. Open to *all* engineering students.

Staff

(C.E.) Spring and Summer Qtrs.

(Other engineering disciplines)

All Quarters

01.194 Environmental Engineering II

(Prereq. 01.193) 4 Q.H.

A continuation of Environmental Engineering I dealing with the design details of various environmental projects. Topics include development of ground and surface water supplies, water and wastewater disinfection methods, design and operation of treatment plants, and industrial waste disposal. Other current engineering projects are also included.

Profs. Meserve and Blanc

Spring Qtr.

01.195 Environmental Laboratory

(Prereq. 01.223 & 01.194) 4 Q.H.*

A design and laboratory course in environmental engineering. In alternating laboratory sessions the student is assigned: 1. an individual design project selected from the areas of water supply and treatment, wastewater collection and disposal, and solid waste and air pollution control, and 2. chemistry laboratory exercises acquainting the student with basic techniques in water and wastewater analysis.

Staff

Spring Qtr.

01.197 Survey of Environmental Problems

4 Q.H.

Enrollment limited to non-engineers

Major topics: water, wastewater, air pollution, and solid waste, will be covered in the following format: What is the problem? Why does it exist? Effects of this condition. Abatement procedures. The interrelationship of environmental conditions is stressed and ecological considerations discussed.

Prof. Wei

All Quarters

01.223 Environmental Chemistry

(Freshman Chemistry) 4 Q.H.

Analytical chemistry principles are studied with reference to environmental engineering applications. The chemistry of processes, such as coagulation, iron and manganese removal, ion exchange, softening, and disinfection are included. The principles of spectroscopy and polarography are also discussed, in addition to gas transfer, oxidation and reduction, and radiation chemistry. Reaction rates with reference to environmental engineering applications such as BOD are studied, as well as topics in organic chemistry and instrumental analysis.

Profs. Cochrane and Wei

Fall and Winter Qtrs.

01.259 Air Pollution

4 Q.H.

Theory and practice related to engineering management of air resources, microclimate and dispersion of pollutants, atmospheric chemistry, air pollution instrumentation, control of gaseous and particulate emissions, and design of air pollution control systems. Biological and chemical aspects of air pollution with emphasis on the toxicological aspects of the environment, physiological effects of aerosols, analysis of organic and inorganic constituents of the atmosphere, and rationale for establishment of air quality criteria and standards.

Prof. Gregory

Spring Qtr.

*Including lab.

Mechanical Engineering

02.116 Dynamics

(Prereq. 01.140) 4 Q.H.
(Not open to M.E. Students)

Kinematics and kinetics of particles and rigid bodies, including work and energy.
 Profs. Phalen and Yorra Fall and Winter Qtrs.

02.130 Thermodynamics I

4 Q.H.

Thermodynamics is the study of the concepts of energy and energy interactions between material systems through the basic laws of thermodynamics. The concepts of energy are discussed, and the first law for the conservation of energy is set forth. A system is described, and its thermodynamic state is defined in terms of properties of substances. An energy analysis of various thermodynamic systems is presented in terms of entropy and the second law. Some consequences of the second law are discussed.

Prof. Zelinski

All Quarters

02.131 Thermodynamics II

(Prereq. 02.130) 4 Q.H.

The general thermodynamic relationships between properties of a substance are developed. The equation of state is discussed for liquids, gases, and magnetic substances. The characteristics of power systems and refrigeration systems are presented. The thermodynamics of nonreacting mixtures of gases, liquids, and solids is set forth with the development of the chemical potential and phase relationships included. Reacting mixtures are studied, and the conditions for chemical equilibrium are outlined.

Prof. Foster

All Quarters

02.132 Introduction to Combustion

(Prereq. 02.130) 4 Q.H.

The basic knowledge necessary to understand combustion phenomena and its application to selected combustion problems. Fundamental principles of thermochemistry, kinetics of chemical reactions, and transport properties of gases are given. The conservation equations for reacting mixtures are discussed. Theories of the combustion of liquid droplets, laminar diffusion flames, and premixed laminar flames are presented.

Prof. Zelinski

Spring and Summer Qtrs.

02.134 Direct Energy Conversion

(Prereq. 02.130) 4 Q.H.

Direct energy conversion is concerned with means for converting heat directly into electrical energy. Included among the devices which accomplish this are magnetohydrodynamic power generators, thermionic omission converters, and fuel cells. The operating principles of these engines are presented, and performance calculations are made. A unified theory of energy conversion is discussed based upon the concepts of irreversible thermodynamics.

Prof. Zelinski

Fall and Winter Qtrs. 1973-74

Not offered 1974-75

02.145 Design Fundamentals

(Prereq. 02.167) 4 Q.H.

Engineering design analysis of dynamically loaded machine elements. Stress concentration, contact and impact stresses, thorough treatment of fatigue factors in design (combined loading and statistical considerations). Environmental factors in design, creep, temperature and atmospheric.

Prof. Rossetos

Fall and Winter Qtrs.

02.146 Mechanical Engineering Design

(Prereq. 02.145) 4 Q.H.

Project, using system approach, which involves all aspects of mechanical engineering: mechanics, thermodynamics, heat transfer, etc. This course is intended to correlate previous courses in optimal design of various mechanical systems. Problem areas investigated may include friction and power transmission devices, hydraulic systems, etc.

Profs. Blanchard and Mills

Spring and Summer Qtrs.

02.147 Engineering Design

(Prereq. 02.167) 4 Q.H.

Intended for students who take only one course in design. Topics covered are stress concentration, fatigue and impact loading, lubrication, friction, and power transmission devices and optimum design.

Prof. Mills

Spring Qtr.

02.148 Design and Analysis

(Open to all seniors) 4 Q.H.

An interdisciplinary course. Project either analytical or experimental supervised by an

interdisciplinary faculty. Examples of projects (e.g., trash disposal, underwater search and rescue).

Prof. Blanchard

All Quarters

02.149 Engineering Analysis

4 Q.H.

Equilibrium problems in systems with a finite number of degrees of freedom (i.e., as opposed to a continuous system), extremum techniques, methods of solving the resulting algebraic equations, examples of physical situations, equilibrium stresses in elastic structures, steady state temperature distribution, steady subsonic flow, electrostatic fields, and steady flow of direct and alternating current.

Profs. Long and Rossettos

Spring and Summer Qtrs. 1973-74

Not offered 1974-75

02.150 Heat Transfer I

4 Q.H.

Modes of heat transfer; steady state and transient conduction, one and two dimensions; exact, numerical and graphical techniques; electrical analogy; natural and forced convection, laminar and turbulent; radiation; change of phase heat transfer; condensation and boiling; heat exchangers.

Prof. Bowman

Spring and Summer Qtrs.

02.155 Fluid Mechanics I

(Prereq. 02.167) 4 Q.H.

Differential and integral formulations of mass conservation and the equations of motion and energy; control volume applications; elements of one-dimensional, steady compressible flow; introductions to boundary layer theory; dimensional analysis and similitude.

Prof. Nelson

Spring and Summer Qtrs.

02.156 Fluid Mechanics II

(Prereq. 02.155) 4 Q.H.

Velocity potential and stream functions; circulation and Kelvin's theorem; two-dimensional, steady irrotational incompressible flow; Karman-Pohlhausen method applied to two-dimensional boundary layers.

Prof. Nelson

Fall and Winter Qtrs. 1973-74

Not offered 1974-75

02.157 Fluid Machinery

(Prereq. 02.155) 4 Q.H.

General principles of turbomachines; similitude and performance curves; specific speed; consideration of turbines, centrifugal pumps and impressors, axial pumps and compressors, regenerative pumps and turbines.

Prof. Nelson

Fall and Winter Qtrs. 1973-74

Not offered 1974-75

02.164 Mechanics

5 Q.H.

Statics, kinematics, and kinetics for transfer students.

Mr. Perl

Fall Qtr.

02.165 Mechanics I

4 Q.H.

The concept and vector representation of force, moment of force, position, displacement, velocity, and acceleration. Equivalent force systems. System modeling, particles and rigid bodies, free body diagrams. Equilibrium; the kinematics and kinetics of particles.

Profs. Dunn and Long

All Quarters

02.166 Mechanics II

(Prereq. 02.165) 4 Q.H.

Continuation of 02.165, Mechanics I. The kinematics and kinetics of rigid bodies. Instantaneous equations of motion, work and energy, impulse and momentum.

Profs. Dunn and Long

Spring and Summer Qtrs.

02.167 Mechanics III

(Prereq. 02.165) 4 Q.H.

Stress and strain in a solid and their transformation properties; stress-strain relation for the linear elastic solid; yield criteria; determination of the stress and deformation of simple members under axial, torsional, and flexural loadings.

Profs. Dunn and Long

Fall and Winter Qtrs.

02.168 Strength of Materials A

(Prereq. 02.167) 4 Q.H.

This course, dealing with the stress and deformation of slender members under flexural loadings, extends considerably beyond the simple shapes and loadings treated in 02.167.

Stresses in symmetric members transmitting both shear and bending; bending of unsymmetrical beams; deflections due to bending by a variety of techniques; treatment of statically indeterminate problems; elastic stability of flexible columns.

Prof. Yorra

Fall and Winter Qtrs.

02.169 Strength of Materials B

(Prereq. 02.167) 4 Q.H.

Application of the principles of the mechanics of elastic solids covered in 02.167 to a wide variety of situations of engineering interest. Energy methods; determination of the deformation and stress in curved members; pressure vessels, beams on elastic foundations, contact stresses; introduction to plastic analysis.

Prof. Phalen

Spring and Summer Qtrs.

02.171 Mechanical Vibrations

(Prereq. 02.166) 4 Q.H.

One, two, and multi-degrees of freedom systems using classical, energy, Laplace, mobility, matrix, and computer techniques.

Prof. Blanchard

Fall and Winter Qtrs. 1973-74

Not offered 1974-75

02.172 System Analysis and Control

(Prereq. 02.166) 4 Q.H.

Theoretical background for analyzing and designing a linear control system. System modeling, linear approximations and their limitations, transfer functions, and block diagramming. Applications of the Laplace transform. Transient and frequency response. Stability, frequency domain, and root locus techniques.

Prof. Chu

Not offered 1973-74

Fall and Winter Qtrs. 1974-75

02.173 Mechanics of Deformable Solids

(Prereq. 02.167) 4 Q.H.

Concept of stress tensor and elementary tensor manipulation, strain concept. The mathematical models of continuous elastic systems, methods of solution-the mathematical model, mathematical models of other deformable solids (ex. plastic, viscoelastic).

Profs. Long and Rossetos

Not offered 1973-74

Spring and Summer Qtrs. 1974-75

02.174 Engineering Astrodynamics

(Prereq. 02.166) 4 Q.H.

Topics covered are: astronomical coordinate systems, gravitational and nongravitational forces on spacecraft, the motion of artificial satellites, and observational techniques. The feasibility of voyages outside the solar system, interplanetary and interstellar navigation, and the hazards of space are discussed.

Prof. Yorra

Fall and Winter Qtrs. 1973-74

Not offered 1974-75

02.175 Analog and Digital Computer Techniques

4 Q.H.*

Analog and digital computers for both time-and displacement-based problems. Review of Boolean Algebra and Digital logic. Applications. Study of software for digital computers. Discussions about hybrid computers.

Prof. Blanchard

Not offered 1973-74

Fall and Winter Qtrs. 1974-75

02.192 Measurement and Analysis

4 Q.H.*

Principles of engineering experimentation and instrumentation (including the thorough introduction to the analog computer) stressed in lectures and in proper design of experiments to minimize experimental error and uncertainty. Testson machines particularly suited to illustrate above and commensurate with students' academic background.

Prof. Phalen

Fall and Winter Qtrs.

02.193 Mechanical Engineering Laboratory

(Prereq. 02.192) 4 Q.H.*

Project-type experiments. Students choose, research, design, and manage experiments which are of particular interest to the group and which illustrate principles of thermodynamics, strength of materials, fluid mechanics, heat transfer, etc.

Prof. Phalen

All Quarters

02.194 Mechanical Engineering Senior Project

(Prereq. 02.192) 4 Q.H.

A project may be of an analytical, design, or experimental nature. It must be approved by the

*Including lab.

faculty member under whom the student will work. A formal report must be submitted to the student's faculty supervisor at the end of the quarter.
Staff

All Quarters

02.196 Materials Science

5 Q.H.*

Crystallography, structure of solids, imperfections in crystals, phase equilibrium basic mechanisms of metal strengthening and mechanical behavior, and the effect of temperature on the structure and properties of materials (recrystallization, recovery, precipitation, rate processes).

Profs. Nowak, Murphy, Zotos

Spring and Summer Qtrs.

02.197 Mechanical Behavior of Materials

(Prereq. 02.196) 4 Q.H.

Elastic properties of materials, atomic basis for elastic constants, dislocation theory, plasticity of crystals and noncrystalline solids. Creep, fracture, fatigue.

Prof. Murphy

Fall and Winter Qtrs.

02.198 Materials Processing

(Prereq. 02.196) 4 Q.H.

Casting, joining, soldering, braxing, welding, mechanical forming, and conventional and nonconventional machining. The topics deal with metals and nonmetals.

Prof. Zotos

Spring and Summer Qtrs.

02.199 Materials Science (Not open to M.E. Students)

4 Q.H.

Covers material in 02.196, but no laboratory work included.

Profs. Nowak, Murphy, and Zotos

Fall and Winter Qtrs.

02.214 Experimental Stress Analysis

(Prereq. 02.167) 4 Q.H.*

Theory and application of mechanical and electrical strain gauges; installation, instrumentation, and circuitry of gauge setups for transducer use and experimental stress analysis; use of brittle coatings; theory and practice of photoelastic methods as applied to models and coatings.

Prof. Mills

Not offered 1973-74

Spring Qtr. 1974-75

02.232 Engineering Materials

(Prereq. 02.196 or equivalent) 4 Q.H.

Thermodynamics of materials; phase equilibria ternary systems; reactions with environment, i.e. kinetics, oxidation, corrosion, etc.; materials design criteria and materials engineering case studies.

Prof. Zotos

Fall and Winter Qtrs. 1973-74

Spring Qtr. 1974-75

02.233 Thermodynamics of Propulsion

110(Prereq. 02.131) 4 Q.H.

Application of the physical principles of thermodynamics, fluid mechanics, and plasmas to the prediction of the behavior of propulsion devices. Air-breathing engines and rocket engines are discussed in detail, with emphasis on realistic applications to demonstrate how physical laws both describe and limit the performance of particular devices. An introduction to plasmas is given. The fundamentals of electrical rocket propulsion are included.

Prof. Zelinski

Not offered 1973-74

Fall and Winter Qtrs. 1974-75

02.235 Statistical Thermodynamics

4 Q.H.

Entropy and randomness assemblies of independent particles; Boltzmann, Rose-Einstein, and Fermi-Dirac statistics; monatomic and polyatomic gases; Einstein and Debye theories of the specific heat of solids; mixed gases; chemical and dissociative equilibrium.

Prof. Nelson

Spring Qtr. 1973-74

Not offered 1974-75

02.236 Nuclear Engineering I

4 Q.H.*

Study of nuclear physics emphasizing atomic and nuclear structure, radioactive decay, and nuclear reactions, with particular attention to fusion and fission. Health physics, nuclear instrumentation, and the production and uses of radioactive isotopes. A general comparison of thermal, fast, and broader reactor types is made prior to a discussion of neutron interactions and their slowing down. The four-factor formula and diffusion equation are

*Including lab.

developed and applied to one-group theory for bare and reflected thermal reactors. Energy production and distribution within the core and flux shaping are discussed.

Profs. Bowman and Foster

Fall and Winter Qtrs.

02.237 Nuclear Engineering II

(Prereq. 02.236) 4 Q.H.

Development of two-group theory for thermal reactors and consideration of the physics and safety of fast reactors. Effect of reactivity change, either intentional or accidental, as well as changes due to temperature, fission product buildup, xenon buildup after shutdown, and fuel depletion discussed. Reactor design considerations considering the interrelationship of reactor physics, reactor engineering control, distribution of power, fuel cycle management.

Profs. Bowman and Foster

Spring Qtr.

02.258 Gas Dynamics

(Prereq. 02.130) 4 Q.H.

Derivation of the conservation laws of fluid flow, wave motion and Mach number, adiabatic flow, calculation of propulsion forces, adiabatic flow with friction, normal shock analysis, analysis of compressible flow with heating or cooling, moving and oblique shock waves.

Prof. Nelson

Not offered 1973-74

Offered Spring Qtr. 1974-75

02.260 Heat and Mass Transfer

(Prereq. 02.150) 4 Q.H.

Review of heat, mass, and momentum transfer analogies; rate equations. Conduction problems in steady-state and transient-state for both heat and mass transfer with various constant and fluctuating boundary conditions in rectangular, cylindrical, and spherical coordinates solved by formal mathematics, difference (relaxation) techniques, and methods of analogy. Thermal stresses induced by nonuniform temperature distributions; heat transfer at high velocity and in rarefied gases; boiling heat transfer at temperature extremes, with forced and natural convection; phase change in bulk stagnant systems.

Prof. Bowman

Fall and Winter Qtrs.

02.270 Dynamics

(Prereq. 02.166) 2 Q.H.

An intermediate course in engineering mechanics. Topics treated are: central force motion, gyroscopic motion, dynamic stability, variational mechanics, and the principle of least action. The Lagrangian equation of motion is developed and applied to problems of the dynamics of particles and rigid bodies.

Profs. Yorra and Lautman

Spring Qtr.

Electrical Engineering

03.111 Circuits and Systems I

(Prereq. 10.1523) 4 Q.H.

Circuit elements (linear, nonlinear, time-invariant, and time-varying) sources (independent and controlled), Kirchhoff's laws, Tellegen's theorem, Thevenin's theorem, network topology, mesh and nodal analysis.

Prof. Kellner

Fall and Winter Qtrs.

03.112 Circuits and Systems II

(Prereq. 3.111) 4 Q.H.

Linearity and time-invariance, system function, forced and force-free response of networks and L.T.I. systems, singularity response, partial fraction expansion, "Pre-box" concept, and signal flow graphs.

Prof. Kellner

Spring and Summer Qtrs.

03.113 Circuits and Systems III

(Prereq. 3.112) 4 Q.H.

Thevenin's theorem revisited, magnitude and phase plots, resonance, two-port networks, energy and power, and convolution.

Prof. Martin

Fall and Winter Qtrs.

03.122 Circuits and Systems IV

(Prereq. 3.113) 4 Q.H.

Fourier analysis, Fourier series and transform, spectral analysis of AM-modulation, bilateral Laplace transform, unilateral Laplace transform, and correlation.

Prof. Schetzen

Spring and Summer Qtrs.

03.131 E.E. Laboratory I-Measurements

(Prereq. 3.111) 2 Q.H.*

Basic electrical measurements, report writing, use of standard laboratory instruments

*Including lab.

including digital voltmeters, oscilloscopes, and bridges.

Prof. Martin

Spring and Summer Qtrs.

03.132 E.E. Laboratory II-Circuits and Systems

(Prereq. 3.112) 2 Q.H.*

Experiments tied in the Circuits and Systems courses, together with more work in measurements.

Prof. Martin

Fall and Winter Qtrs.

03.133 E.E. Laboratory III-Devices

(Prereq. 3.141) 2 Q.H.*

Introduction to the analog computer, electro-optics, terminal characteristics of active devices.

Prof. Martin

Spring and Summer Qtrs.

03.134 E.E. Laboratory IV

(Prereq. 3.142, 3.161) 2 Q.H.*

Analog computation, logic circuits, design and testing of active circuits, microwaves studies, control systems.

Prof. Martin

Fall and Winter Qtrs.

03.141 Electronics I

(Prereq. 3.122) 4 Q.H.

This first course in electronics stresses the significance of nonlinear active devices as related to the behavior of circuits and systems concerned with functions in the frequency domain. Linear models for diodes, and discrete and integrated circuit active devices are developed to cope with the d-c characteristics and incremental gain and impedances of such devices. The concept of ideal amplification is modified to stress the limitations imposed upon bandwidth and gain by impedance levels, noise, parameter variation, and distortion encountered with current active devices. Consideration is given to cascaded stages, composite two-part, hybrid, and nonhybrid configurations.

Profs. Grabel and Cochrun

Fall and Winter Qtrs.

03.142 Electronics II

(Prereq. 3.141) 4 Q.H.

This course is a continuation of Electronics I. Consideration is given to various types of coupling for cascaded stages, with emphasis on the differential configuration as the heart of the generalized operational amplifier. The topic of feedback for single loop amplifiers emphasizes the concept of loop gain and its influence on gain, impedance levels, bandwidth, and stability. Consideration is given to both desirable and undesirable stability concepts. The topic frequency translation included AM, FM, and PM systems. Frequency selective amplifiers are considered on the basis of LC-tuned circuits and active filters.

Profs. Grabel and Cochrun

Spring and Summer Qtrs.

03.144 Electronics III

(Prereq. 3.142) 4 Q.H.

This course is a continuation of Electronics II. Operational amplifiers are introduced, with consideration given to their operation, limitations, and applications. Applications include linear functions in the frequency domain and analog arithmetic operations. The topic, digital circuits, is related to the basic structure of digital computers. Consideration is given to the fundamental operation of active devices, bipolar, J-FET's and MOS-FET's, as switches, logic gates, function generation, pulse and delay circuits, and memories. These fundamental operations are related to current integrated circuits, including MSI and LSI.

Profs. Cochrun and Grabel

Fall and Winter Qtrs.

03.161 Electromagnetic Field Theory I

(Prereq. 10.156, 11.207) 4 Q.H.

Definition and representation of scalar and vector fields. Coordinate systems; elements of vector calculus; definition of the concepts of gradient, divergence, curl, and the "del" operator; free-space electrostatics; definition of the electric field intensity; the scalar potential; solution to Poisson and Laplace equations; macroscopic model of dielectric materials; the electric polarization and the electric flux density vector; boundary conditions; Lorentz force; free space magnetostatics; magnetic vector potential and solution to the "vector" Poisson equation; macroscopic model of magnetic materials; magnetization and magnetic field intensity; boundary conditions.

Prof. Schwab

Fall and Winter Qtrs.

*Including lab.

- 03.162 Electromagnetic Field Theory II

(Prereq. 3.161) 4 Q.H.

Generalization of the Maxwell equations to the case of time-varying fields; Faraday induction law; wave equations and the plane wave solution; Poynting theorem and the concept of energy stored by the fields; reflection and refraction of plan waves; time harmonic wave equations for the scalar and vector potentials; time harmonic form of retarded potentials; radiation from a dipole; motion of charged particles in fields; magnetoionic media; elementary discussion of plasma physics and M.H.D.

Prof. Schwab

Spring and Summer Qtrs.
- 03.174 Basic Power Circuits

(Prereq. 3.112) 2 Q.H.

Balanced and unbalanced polyphase power circuits, harmonics, symmetrical components, and application to the solution of fault conditions in power circuits.

Prof. Cleveland

Fall and Winter Qtrs.
- 03.175 Electromechanical Dynamics

(Prereq. 3.113, 3.162) 4 Q.H.

Review of Maxwell's equations and quasistatic approximations, electric and magnetic energy concepts, state variable formulation of electromechanical coupling. Applications to elementary energy conversion devices, singly and doubly-excited magnetic devices with mechanical translational and rotational elements. Generalized rotating electromagnetic energy converters, circuit-model concepts, applications to selected extant rotating machines: i.e., commutator machines and a-c machines; dynamic response to various stimuli.

Prof. Cleveland

Fall and Winter Qtrs.
- 03.176 Machines and Systems

(Prereq. 3.174, 3.175) 4 Q.H.

A detailed investigation of the operating principles of synchronous machines, synchronous motor and generator power-angle characteristics, machine dynamics, machine and power system stability.

Prof. Cleveland

Spring Qtr.
- 03.183 Electrical Engineering I

(Prereq. 10.152) 4 Q.H.

Introductory course to electric circuit theory covering Kirchhoff's Laws, loop and nodal analysis, Thevenin's theorem, power and energy, exponential excitation and the system function.

Not open to E.E. majors

Prof. Grabel

Fall and Winter Qtrs.
- 03.184 Electrical Engineering II

(Prereq. 3.183) 4 Q.H.

Properties and analysis of electronic devices, circuits, and systems; elements of control systems; principles of energy conversion. Emphasis on each topic determined according to major discipline.

Not open to E.E. majors

Prof. Grabel

Spring and Summer Qtrs.
- 03.185 Power System and Controls

(Prereq. 03.183) 4 Q.H.

Basic concepts of electromechanical energy conversion stressing the terminal characteristics and operation of d-c and a-c machines, elements of power distribution systems, and concepts of feedback control, with applications to power systems and plant control.

Prof. Grabel

Spring Qtr.
- 03.186 Basic Electrical Instrumentation

(Prereq. 03.183) 4 Q.H.*

Basic electrical measurement devices including ammeters, voltmeters, oscilloscopes, and bridges; instrumentation techniques such as direct measurement, comparative measurement, and analog methods. Application to nonelectrical disciplines is included.

Prof. Grabel

Spring Qtr.

*Including lab.

03.187 Modelling Techniques

(Prereq. 03.183 and 03.184; also Fortran IV programming.) 4 Q.H.

Introduction to the concept of modelling techniques to represent physical, biological, and social systems; electrical analogs and use of analog computers; introduction to digital modelling and the use of digital computation.

Prof. Grabel

Fall and Winter Qtrs.

03.191 Design and Organization of Digital Computers (Prereq. or Coreq. 3.142) 4 Q.H.

Description of the basic components of a stored-program digital computer. Topics covered include: number system and binary data representation, coding and flow charting, instruction formats and repertoires, arithmetic and logical computer operations; storage of data sets and data flow within a computing system, hybrid computation, organization and control of special purpose computers, memory types and hierarchies, man-machine communications, selected examples of computer applications.

Prof. Rabinovici

All Quarters

03.218 Control System Theory

(Prereq. 3.142) 4 Q.H.

Control system concepts; goals and basic components. Review of time and frequency domain techniques. Classical control system theory; error analysis for different type systems. Analyses of second- and third-order systems. Stability and relative stability using root locus and Nyquist diagrams. The Nichols chart. Compensation, application of computer technology to control systems analysis and design. State variable description of dynamic systems. The state equations and the fundamental analog realization of the standard equations. Solution of the state equations. Properties of the state transition matrix. Optimal systems. Introduction to sampled data systems. The Z-transform as an analog to the Laplace transform.

Prof. Loewenthal

Fall and Winter Qtrs.

03.221 Electric Power Systems I

(Prereq. 3.174) 4 Q.H.

This course, along with that following it, is designed to give a broad view of the structure of those electric systems whose primary function is energy transfer, and especially those whose function is the transfer of large quantities of energy. The functions of the various system elements are described and their significant characteristics are investigated briefly. The interrelation between elements is treated.

Prof. Cogbill

Fall and Winter Qtrs

03.222 Electric Power Systems II

(Prereq. 3.221) 4 Q.H.

A continuation of Electric Power Systems I. Problems such as voltage control, protection economics, and planning which relate to the system as a whole. Taken with the previous course, it provides a general background for more intensive studies of electric power systems.

NOTE: A student may take both electives in sequence or may take the first course only.

Prof. Cogbill

Spring Qtr

03.233 E.E. Power Laboratory I

(Prereq. 3.174) 2 Q.H.

Experimental work with polyphase power equipment, power measurements, polyphase power rectification, steady-state and dynamic operation modes of polyphase induction motors, power transformers and symmetrical component analysis of unbalanced loading of transformers, analog computer.

Prof. Cleveland

Fall and Winter Qtrs

03.234 E.E. Power Laboratory II

(Prereq. 3.172, 3.233) 2 Q.H.

Experimental work with rotating machinery and systems; steady-state and dynamic modes of operation of the commutator and synchronous machines; system study involving synchronous machines; selected experiments in control systems; network analyzer studies.

Prof. Cleveland

Spring Qtr

03.237 Senior Project Laboratory I

(Prereq. 3.142, 3.162) 2 Q.H.

In this course students work with a faculty adviser on some term project, either experimental

*Including lab

or theoretical.
Prof. Martin

03.238 Senior Project Laboratory II (Prereq. 3.142, 3.162) 2 Q.H.*

This course may be a continuation of the project started in 03.237 or it may be a new project. Again, the student works closely with a faculty adviser.
Prof. Martin

03.241 Selected Topics in Electronics (Prereq. 03.144) 4 Q.H.

A systems approach to the design of both digital and analog data-processing circuits. Circuits discussed include: shift-registers, adders, analog-to-digital and digital-to-analog converters, analog logic, function generators, and analog arithmetic units. Also included are the topics of noise in electronic circuits, and gain, frequency, and phase control.

Spring Qtr.

03.242 Theory and Technology of Semiconductor Devices I (Prereq. 2.196) 4 Q.H.*

This course comprises a closely coupled lecture and laboratory series. Topics covered include: technology and physics of the planar diffusion process, electronic properties of homogeneous semiconductors, inhomogeneities and junctions (Fermi potential diagrams, equilibrium at an abrupt discontinuity, and the behavior of a junction under applied bias), the junction transistor.

Prof. Feldman

Fall and Winter Qtrs.

03.243 Theory and Technology of Semiconductor Devices II (Prereq. 3.242) 4 Q.H.*

This course is a continuation of 03.242. Material covered includes: introduction to unipolar transistor action, introduction to surface effects, the MOS-FET, and a discussion of noise problems encountered in semiconductor devices.

Prof. Feldman

Spring Qtr.

03.251 Communication Theory (Prereq. 3.122) 4 Q.H.

Introduction to classical modulation theory, probability theory, and some recent developments in communication theory. Topics include: signal space concepts, AM and FM, pulse modulation, matched filter, autocorrelation function, sampling theorem, probabilistic description of signals, source entropy, and channel capacity.

Prof. Gonsalves

Spring Qtr.

03.261 Wave Transmission and Reception (Prereq. 09.106, 09.107) 4 Q.H.

Analysis of radiation, transmission, and reception of electromagnetic and acoustic waves using graphical and digital computer techniques. Design of distributed systems, antennas, microphones, loudspeakers, and sonar transducers.

Prof. Remillard

Spring and Summer Qtrs.

03.262 Advanced Topics in Electromagnetic Field Theory (Prereq. 3.162) 4 Q.H.

This course is a continuation of the required courses in field theory. Topics covered include (but are not limited to): microwave and waveguide structures, careful development of electromagnetic energy and force concepts, and an introduction to radiation and antenna theory.

Prof. Schwab

Spring Qtr.

03.281 Fundamentals of Computation Structures (Prereq. 3.191) 4 Q.H.

Introduction to organization principles of the General Purpose Stored Program Computer; analysis of basic logic functions employed in a digital computer system; logical structure of a central processing unit; basic arithmetic algorithms and speed-up techniques. Memory Structures, trends in memory systems organization and speed capacity trade-offs, addressing techniques and storage allocations. Logical design and physical realization of functional building blocks of automatic-digital machines.

Prof. Rabinovici

Fall and Winter Qtrs.

03.285 Introduction to Theory of Digital Computation 4 Q.H.

Elementary number theory, elements of Boolean algebra, rings and groups, combinations,

*Including lab.

permutations, and recurrence functions, study of the properties of analysis and representations of algorithms, coding of information for efficient processing. Study of finite state machines and elementary computing machines.

Prof. Weng

Spring and Summer Qtrs.

03.292 Mathematical Techniques in Electrical Engineering I

(Prereq. 10.156 or equivalent) 4 Q.H.

Definition and representation of a complex variable and of functions of a complex variable. Topics covered are: conformal mapping, singularities, Laurent series, residues, and contour integration. Applications of complex variable theory to Fourier theory, Hilbert transforms, conformal transformations in the analysis of linear systems and in electrostatics.

Prof. Carrabes

Fall, Winter, and Spring Qtrs.

03.293 Mathematical Techniques in Electrical Engineering II

(Prereq. 10.156 or equivalent) 4 Q.H.

Matrix notation and development of matrix algebra. The solubility of sets of linear equations; determinants, linear transformations, invariance, quadratic forms and eigenvalues. Illustrative applications of matrix techniques for the formulation and solution of problems drawn from the realm of circuit theory, probability theory, and engineering physics.

Prof. Carrabes

Fall, Winter, and Spring Qtrs.

03.295 Numerical Methods and Computer Applications (Prereq. 9.106, 3.122) 4 Q.H.

Presentation of numerical techniques used in solving scientific and engineering problems with the aid of digital computers. Topics covered include: modeling and simulation of deterministic and probabilistic systems, theory of interpolation, iteration methods, numerical solution of ordinary and partial differential equations, signal detection, and use of libraries of scientific subroutines. Representative problems are chosen for solution on a digital computer.

Prof. Remillard

Fall and Winter Qtrs.

03.296 Digital Techniques

(Prereq. 3.142, 3.191) 4 Q.H.

The characterization of devices, circuits and integrated structures encountered in digital systems, digital data transmission, error rates and systems parameters, synchronous-asynchronous information processing techniques related to bulk and surface storage media. Digital system reliability, failure rates, redundancy techniques. Computer-aided design, testing of digital systems, timing considerations in digital systems.

Prof. McCarthy

Spring Qtr.

Chemical Engineering

04.101 Chemical Engineering Calculations I

(Prereq. 12.115) 4 Q.H.*

Application of the fundamental laws of mass and energy conservation and equilibrium concepts to chemical and physical processes; economic considerations leading to optimal solutions. A computational laboratory is included to improve the facility of the student in handling sophisticated problems. Analog and numerical approaches are stressed where applicable.

Prof. Buonopane

Fall and Winter Qtrs.

04.102 Chemical Engineering Calculations II

(Prereq. 4.101) 4 Q.H.

Simultaneous application of energy and mass conservation laws coupled with equilibrium considerations to comprehensive problems selected from the chemical processing industries; both steady and unsteady state processes.

Prof. Buonopane

Spring and Summer Qtrs.

04.111 Chemical Engineering I

(Prereq. 4.102) 4 Q.H.

The important unit operations of chemical engineering. Fluid mechanics, heat transfer, and evaporation.

Prof. Stewart

Fall and Winter Qtrs.

*Including lab.

04.112 Chemical Engineering II

(Prereq. 4.111) 4 Q.H.

A continuation of 4.111. Drying, distillation, absorption, and extraction.

Prof. Stewart

Spring and Summer Qtrs.

04.121 Transport Phenomena I

(Prereq. 4.112) 4 Q.H.

Chemical engineering from the transport phenomena standpoint. Introduction to fluid properties, derivations of the conservation equation for mass, momentum, and energy; solutions of differential equations in conduction; unsteady state heat transfer; and laminar fluid motion.

Prof. Williams

Fall and Winter Qtrs.

04.122 Transport Phenomena II

(Prereq. 4.121) 4 Q.H.

A continuation of 4.121. Convective heat transfer, turbulent fluid motion, mass transfer by molecular and eddy diffusion, mass transfer in laminar and turbulent motion, and simultaneous heat, mass, and momentum transfer.

Prof. Williams

Spring and Summer Qtrs.

04.123 Experimental Methods I

(Prereq. 4.112) 4 Q.H.*

Experimental engineering methods; basic measurements, design of experimental apparatus, laboratory report writing, design of experiments, and data accuracy are stressed. Suitable experiments are performed.

Prof. Troupe

Fall and Winter Qtrs.

04.124 Experimental Methods II

(Prereq. 4.123) 4 Q.H.*

A continuation of 4.123 with emphasis on the development of an experimental program, reduction of data, and presentation of results; use of computers in simulating experimental conditions and for constructing mathematical models.

Prof. Troupe

Spring and Summer Qtrs.

04.126 Chemical Engineering Thermodynamics

(Prereq. 4.102, 12.167) 4 Q.H.

The first law and its application to batch and flow systems, heat effects in chemical and physical processes, thermodynamic properties, the second law, entropy, physical and chemical equilibria; emphasis on the fundamental principles and mathematical relationships and their application to the analysis and solution of a variety of engineering problems.

Prof. Goodwin

Fall and Winter Qtrs.

04.131 Process Design

(Prereq. 4.122, 4.126) 6 Q.H.*

The class participates in the process design of a chemical plant capable of producing a specified annual tonnage of a chemical when specific raw materials are available. The fundamentals of chemical engineering science, practice, analysis, and economics which have been studied in previous courses are used to prepare a report containing flow sheets, material and energy balances, designs of processing units, and cost estimates of the capital requirements for procuring, erecting, and operating the plant.

Mr. Regan

Fall and Winter Qtrs.

04.132 Process Design

(Prereq. 4.131) 6 Q.H.*

Each student or a small group of students designs a chemical plant to produce a specified annual tonnage of one or more chemicals with a specific feed stock. The techniques used in Process Design I are used by each student to prepare an individual process design report and cost estimate for the particular plant assigned.

Mr. Regan

Spring Qtr.

04.133 Projects

(Prereq. Senior student and consent of Dept.) 6 Q.H.*

Individual research related to some phase of chemical engineering. Open only to students selected by the department head on the basis of scholarship and proved ability.

Prof. Troupe and Staff

Fall and Winter Qtrs.

04.134 Projects

(Prereq. 4.133) 6 Q.H.*

A continuation of the research work undertaken in 4.133.

Prof. Troupe and Staff

Spring Qtr.

*Including lab.

- 04.135 Introduction to Nuclear Engineering** (Prereq. 10.156, 11.206) 4 Q.H.
Review of nuclear physics, nuclear fission, the nuclear chain reaction, reactor theory, radiation shielding, materials of construction, reactor instrumentation and control, separation of stable isotopes, chemical separation, processing and special techniques of nuclear engineering.
Prof. Buonopane 1973-74 Fall and Winter Qtrs.
- 04.136 Chemical Engineering Kinetics** (Prereq. 12.167, 4.126) 4 Q.H.
Fundamental theories of a rate of chemical change including collision and transition state theory in homogeneous reacting systems; integral and differential analysis of kinetic data and a design of batch and continuous flow chemical reactors; catalysis theory and design of catalytic reactors.
Prof. Goodwin Spring and Summer Qtrs.
- 04.137 Applied Mathematics in Chemical Engineering** (Prereq. 10.155) 4 Q.H.
Formulation and solution of problems involving advanced calculus as they arise in chemical engineering situations. Methods covered include ordinary differential equations, series solutions, partial differential equations, and numerical solution techniques. Emphasis is placed primarily on methods for formulating these problems.
Prof. Goodwin 1973-74 Spring Qtr.
- 04.138 Process Control Systems** (Prereq. 10.155 or permission) 4 Q.H.
Introduction to the principles of automatic control systems. Emphasis on modeling, stability, and design of linear feed-back systems for control of temperature, liquid level, and composition.
Prof. Stewart 1973-74 Fall and Winter Qtrs.
- 04.141 Junior Honors Program** (Prereq. Approval of Dept.) To be assigned.
Those students undertaking a Junior Honors Program may petition for two credits for the research problem undertaken.
Prof. Troupe Not offered 1973-74
- 04.142 Introduction to Optimization** (Prereq. 10.155) 4 Q.H.
Elementary optimization techniques are applied to problems encountered in the chemical processing industry. These techniques include gradient search, pattern search, linear and dynamic programming. A knowledge of differential calculus is required.
Prof. Williams Spring Qtr.
- 04.143 Special Topics** (Prereq. Senior Standing) 4 Q.H.
Chemical engineering topics of interest to the staff member conducting the class are presented for study.
Prof. Troupe and Staff Spring Qtr.
- 04.145 Mass Transfer Operations** (Prereq. 4.122 Transport Phenomena II) 4 Q.H.
Calculation and design methods used in processes involving mass transfer. Topics covered include vapor liquid equilibria for binary and multicomponent systems, multicomponent distillation, absorption and extraction. Emphasis is placed on methods and techniques involving digital computer computations.
Prof. Williams Not offered 1973-74
- 04.146 Introduction to Nuclear Engineering (E.E.)** (Prereq. 10.156, 11.207) 4 Q.H.
Course for Electrical Engineering Power Systems students. Introduction to nuclear engineering, fundamental concepts of nuclear power, nuclear reactors and power plants, radiation protection and safety. Supplementary laboratory experiments.
Prof. Buonopane Spring Qtr.
- 04.147 Analysis of Chemical Processes** (Prereq. 4.126, 4.136) 4 Q.H.
Methods and reactions used for making chemical products on a large scale. Topics covered include types of physical and chemical equilibria, flow sheet patterns, energy management.

*Including lab

and catalytic and noncatalytic rate problems. A number of situations involving simultaneous application of the above topics in process analysis are studied.

Prof. Goodwin

Not offered 1973-74

04.148 Management in the Chemical Industries

(Prereq. senior standing in engineering) 4 Q.H.

Principles of management as applied to the chemical process industries. Case studies are used wherever possible, and outside experts are scheduled to lead some of the seminar sessions.

Prof. Troupe

Not offered 1973-74

04.149 Kinetics of Polymerization Processes

(Prereq. 4.136, 12.148) 4 Q.H.

The mechanisms by which polymeric materials are assembled via chemical reaction. Reaction rate models based on these mechanisms are utilized to investigate the effect of reaction parameters on the chemical and physical structure of the polymeric product. The types of polymerization processes considered are free radical addition, condensation, and ionic polymerization.

Prof. Williams

Not offered 1973-74

Industrial Engineering

05.128 Work Design

4 Q.H.*

Philosophy and principles of work design; use of graphic models such as process charts, operation charts, man-machine charts, etc. Work measurement techniques including stop watch, synthetic standard, and work sampling. Extensive use of projects.

Prof. Hoover

Fall and Winter Qtrs.

05.129 Manufacturing Processes

4 Q.H.*

Principles and techniques in processes for the manufacture of articles of commerce, with emphasis on process design and cost, and consideration of process control and automation; metal working, forming, machining, and bonding; job-shop tooling and techniques; plastics and rubber forming and extruding; textiles, paper, electronics, food processing, and other manufacturing operations. Principles and procedures to obtain optimum value in products, methods of revealing excessive costs; relationship of value analysis to design, manufacturing procurement, and installation.

Prof. Hulbert

Spring and Summer Qtrs.

05.130 Systems I

(Prereq. 10.146) 4 Q.H.

Linear feedback systems and solutions for steady state in first-order systems. Integral and derivative control. LaPlace transforms for continuous systems analysis and Z-transforms in discrete systems. Transfer functions.

Prof. Satia

Spring and Summer Qtrs.

05.131 Systems II

4 Q.H.

Continuation of Systems I with emphasis on applications; inventory, distribution, and information systems; introduction to simulation of large systems with analog and digital computers.

Prof. Satia

Fall and Winter Qtrs.

05.145 Probabilistic Analysis for Engineers

(Prereq. Integral & Differential Calculus) 4 Q.H.

Development of probability theory which underlies such engineering problems as inventory, queuing, and quality control. Probability theory presented axiomatically, with emphasis on sample space representation of continuous and discrete random variables. Material will cover standard distributions: i.e., normal, gamma, exponential, poisson, binomial, and others. Topics include expectation, transform techniques, change of variable.

Prof. Hoover

Spring and Summer Qtrs.

Including lab.

05.147 Statistics I

(Prereq. 10.208) 4 Q.H.

Definition of a statistic; distributions of random variables including normal, t, chi-square, F, poisson, binomial; estimation of parameters-point estimation by method of moments, maximum likelihood, Bayes estimates.

Prof. Hoover

Fall and Winter Qtrs.

05.148 Statistics II

(Prereq. 5.147) 4q.H.

Interval estimation, stating and testing hypothesis, linear regression, analysis of variance, applied topics such as reliability, quality control, decision theory from Bayes Rule.

Spring Qtr.

05.149 Reliability and Quality Control

(Prereq. 5.147) 4 Q.H.*

Applied probability and statistical inference techniques are utilized in reliability analysis and quality control. Both theory and application are discussed in relation to the total quality assurance program.

Staff

Spring and Summer Qtrs. 1974

05.150 Industrial Cost Control

4 Q.H.

Fundamental concepts of accounting, with emphasis on use of financial records for making engineering decisions. Study of financial statements of a firm. Contrast in usefulness of data from absorption costing vs. direct costing.

Interpretation of variance accounts.

Prof. Freeman

Fall and Winter Qtrs.

05.151 World Dynamics

4 Q.H.

Feedback analysis of industrial dynamics is used to set forth a dynamic computer model of world scope to include the interactions among population, capital investment, geographical space, natural resources, pollution, and food production. The interactions of these major sectors are studied by means of the computer, and various technological and political policies are tested and evaluated over spans of up to 250 years. The quality of life is suggested as a crucial factor in world equilibrium. *Computer programming experience not necessary.*

Fall and Winter Qtrs.

05.152 Urban Dynamics

4 Q.H.

Drawing upon the feedback analysis of industrial dynamics, this course studies the growth processes of urban areas. The complex interactions between economic and social activities are sufficiently complicated to demonstrate that intuition alone cannot devise useful policies involving the growth and stagnation of industry, housing, and the movement of people. The life cycle of an urban area is examined in detail with the help of a computer model. The model is studied and manipulated to test various policies. *Computer programming not necessary.*

Spring and Summer 1974

Spring 1975

05.161 Operations Research I

4 Q.H.

Deterministic models including L.P. and duality, transportation and allocation, sensitivity and post-optimality analysis. Network analysis including maximal flow, shortest route, and PERT; dynamic programming and recursive functional expressions; game theory.

Prof. Freeman

Spring and Summer Qtrs.

05.163 Operations Research II

(Prereq. 10.208) 4 Q.H.

Stochastic models in O.R.; their analytical development and solution. Topics covered: queuing models, deterministic and stochastic inventory models, Markov chains, sequencing.

Prof. Freeman

Fall and Winter Qtrs.

05.165 Production and Inventory Control

(Prereq. 10.208 or equivalent) 4 Q.H.

Basic inventory models and inventory management systems. Single-stage and multi-stage systems and their dynamics. Production control and aggregate planning. Mathematical and heuristic approaches to aggregate scheduling. Cost structure and decision framework

*Including lab.

oriented analysis. Consideration of job-shop scheduling and dispatching problems.
Prof. Green Spring and Summer Qtrs. 1975 and odd years.

05.166 Computer-Aided Facilities Design 4 Q.H.*

Application of quantitative techniques such as queuing theory and engineering economy to problems involving facilities planning and materials handling. Basic graphical tools, models for plant layout, and laboratory projects.

Any Quarter by Preregistration

05.169 Advanced Topics in Operations Research (Prereq. 5.163) 4 Q.H.

Topics are: duality Kuhn-Tucker conditions, Lagrangian techniques, static and dynamic stochastic decision processes, model formulation, and analysis.

Prof. Freeman Spring Qtr.

05.186 People in Organizations 4 Q.H.

The individual in the work environment. Work theory, motivation, and interpersonal relations based on the concepts of the behavioral sciences; structure and dynamics of organizations; problems of innovation; case studies for situational analysis to develop skill in applying behavioral concepts.

Prof. Fisher Fall and Winter Qtrs.

05.187 Industrial Relations 4 Q.H.

Analysis of industrial relations and organized labor, with emphasis on the historical developments leading to their current status. Union organization and philosophy, interaction of management, government and labor, collective bargaining, the labor contract, the personnel function, and the engineer's role in industrial relations.

Prof. Fisher Spring Qtr.

05.190 Senior Project 1 Q.H.

A significant industrial engineering project executed independently by the student, culminating in a well-organized and well-written report to be submitted to his class adviser and reviewed by a faculty committee. No regularly scheduled classes. Pass/fail basis.

Class Advisers Fall and Winter Qtrs.

05.201 Principles of Computation and Programming I 4 Q.H.

Review of algorithms, computers, and programming at the FORTRAN level. Machine language programming (instruction execution and addressing techniques). Coding and representation of data and structure. Subroutines, input-output, and simultaneous operations. Assemblers and loaders. Introduction to list structures and data organization. Program debugging and verification. Survey of machines, devices, and languages.

Prof. Green Spring and Summer Qtrs.

05.202 Principles of Computation and Programming II (Prereq. 5.201 or permission of instructor) 4 Q.H.

Computer and programming system organization. Continuation of machine language programming from 5.201. Operating systems and supervisors. Processing of lists, strings, arrays, stacks, trees, and graphs. Survey of storage and computation equipment. Concepts of time sharing and real time. Properties and characteristics of algorithmic, list, and string processing languages to engineering problems.

Prof. Green Fall and Winter Qtrs.

05.240 Digital Simulation Techniques (Prereq. FORTRAN) 4 Q.H.

Design and construction of digital, discrete simulation models. Extensive use of FORTRAN and special simulation languages. Discussion of model logic and specification, testing, validation, and use. Several simulation projects using the Northeastern computer facilities.

Prof. Green Spring and Summer

Including lab.

05.241 Management Information Systems

4 Q.H.

Managerial applications of digital computers. The use of computers in information, decision-control systems. Information-based theories of management. Survey of information technology. Computer system basics. Cost and value of information. System design, analysis, equipment selection. Organizational implications.

Prof. Green

Fall, Winter, and Spring Qtrs.

05.245 Basic Engineering Statistics

4 Q.H.

Introduction to basic probability distributions, including the binomial and hypergeometric, exponential, poisson, and normal; laboratory data analysis; statistical test of hypotheses about central tendency and variability; curve fitting with least squares on engineering data. Not open to Industrial Engineers.

Staff

Fall, Winter, and Spring Qtrs.

05.260 Engineering Economy

4 Q.H.

The formulation of analytical techniques: i.e., rate of return, present worth, and annual cost. The application of these techniques to reach economical solutions to business and engineering problems involving design, selection, replacement, lease-buy-decisions, and decisions between multiple alternatives. Sensitivity analysis and basic probability are introduced in cases where uncertainty exists. Brief survey of sources and costs of capital, debt-versus-equity-financing, and leverage.

Prof. Satia

All Quarters

05.261 Engineering Economy and Statistical Decision Theory

(Prereq. 5.145 or 10.208) 4 Q.H.

The objective of the course is to familiarize the students with the theory and techniques of economic evaluation of investment project. Introductory steps in the analysis of investment proposals, time value of money, and cash flows; analysis of deterministic and stochastic cash flows in terms of present worth, annual cost, rate of return, and benefit/cost ratio. Decision tree for sequential decisions, criteria for decision making under uncertainty, utility theory, value of information, effect of accounting procedures and taxes on investment analysis. Case studies involving replacement, lease, engineering design, and public projects.

Staff

First Offering

Fall and Winter Qtrs. 1975

05.267 Special Topics in Engineering

(Prereq. 5.260) 4 Q.H.

Analysis of the capital structure of firms, the cost of various security types and the total cost of capital, case studies of engineering problems involving retirement-replacement decisions, lease-buy decisions and capital expenditure decisions. Consideration of the impact of income taxes, inflation, and leverage; analysis of accounting data for managerial decisions; introduction to Bayesian statistics and utility theory and their application to engineering problems involving uncertainty.

Spring Qtr. 1974 and Spring & Summer Qtrs. 1975

05.290 Independent Study in Industrial Engineering

1—4 Q.H.

For students usually in the senior year with high scholastic standing on advanced I.E. topics. Projects may be of an applied or theoretical nature; formal report submitted to student's project supervisor at the end of quarter.

Adviser

All Quarters

Engineering Technology**MECHANICAL ENGINEERING TECHNOLOGY****02.411 Mechanics A**

(Prereq. 10.320, 11.317) 4 Q.H.

Forces, moments, couples, statics of particles and rigid bodies in two and three dimensions. Distributed forces: external and internal. First moments and centroids. Analysis of structures: trusses, frames and machines.

02.412 Mechanics B

(Prereq. 02.411) 4 Q.H.

Friction, second moments and virtual work. Kinematics of particles: rectilinear and curvilinear motion of dynamic particles. Force, mass and acceleration, work, and energy.

02.413 Mechanics C

(Prereq. 02.412) 4 Q.H.

Impulse and momentum of particles. Kinematics and dynamics of rigid bodies: force, mass, and acceleration. Dynamics of rigid bodies: work and energy, impulse and momentum. Introduction to mechanical vibration.

02.414 Stress Analysis A

(Prereq. 02.411) 4 Q.H.

Stress and deformation, mechanical properties of materials, allowable stresses and factors of safety, axially loaded indeterminate members, effects of temperature on stresses and strains, thin cylinders and spheres. Riveted and welded joints. Shear and bending moment in beams, stresses in beams, design of beams, curvature of beams.

02.415 Stress Analysis B

(Prereq. 02.414) 4 Q.H.

Determinate and indeterminate beam deflections and reactions by numerical and graphical integration and area moment methods; theorem of three moments. Torsional stresses and strains; power transmission; eccentric loads on struts, beams, riveted and welded joints; combined and principal stresses; Mohr's circle; theories of failure.

02.416 Stress Analysis C

(Prereq. 02.415) 4 Q.H.

Curved beams, non-symmetrical bending of beams, short-center and shear stresses on thin sections, composite beams. Columns, energy absorption and resilience, inertial stresses, impact loading, deflection of beams by energy methods. Bolted fastenings.

02.417 Mechanical Design A

(Prereq. 02.415) 4 Q.H.

Failure criteria, properties and selection of materials, manufacturing considerations, stress concentrations, strength under combined stresses, theories of failure, impact and fluctuating and repeated loads. Stresses, deformation and design of springs; screws, keys, pins and interference fits; preloading of bolted joints; shafts and flywheels; friction brakes.

02.418 Mechanical Design B

(Prereq. 02.417) 2 Q.H.

Lubrication and journal bearings; antifriction bearings; stresses and power transmission of spur, bevel, and worm gear; screws for power transmission.

02.421 Thermodynamics A

(Prereq. 11.318) 4 Q.H.

General theory of heat and matter, laws of thermodynamics, energy-transformation principles and availability of energy, properties and processes for pure substances and ideal gases. Thermodynamic properties and processes of liquids and vapors, tables and charts, mixtures of fluids, vapor cycles.

02.422 Thermodynamics B

(Prereq. 02.421) 4 Q.H.

Theory of vapor engines and analysis of types of actual engines using compression of gases and vapors; internal combustion engines. Theory of gas and vapor flow through orifices and nozzles. Principles of gas compression, analysis of vapor compression, refrigeration systems, low-temperature refrigeration cycles and absorption refrigeration systems.

02.423 Thermodynamics C

(Prereq. 02.422) 4 Q.H.

Air-conditioning principles including psychometrics and heat pumps. Calculation of heating and cooling loads in accordance with A.S.H.R.A.E. practices. Design and performance of steam and gas turbines; spark-ignition and compression-ignition engine design and performance. Fan performance.

02.424 Thermodynamics D

(Prereq. 02.422) 2 Q.H.

The primary modes of heat transfer; thermal conductance/resistance concept; thermal-electrical analog; combined heat transfer mechanisms; basic equations of conduction; thermal conductivity. Analytical solutions of various steady state conduction problems.

02.425 Thermodynamics E

(Prereq. 02.424) 4 Q.H.

Dimensional analysis and similarity considerations, natural and forced convection,

hydrodynamic and thermal boundary layers, log-mean temperature differences, overall heat transfer coefficients, applications to heat exchangers. Black body radiation; Kirchoff's Law; emissivity and absorbance; radiation between simple bodies. Graphical and numerical methods applied to steady state, conduction problems; radiation and convection effects; transient heat transfer; numerical methods applied to transient problems; heat transfer engineering problems.

02.431 Materials A

4 Q.H.

Lectures on fundamental metallic structures; general metallurgical information covering theoretical aspects of properties, testing, and failure of metals. Supplemented by visual aids. Lectures on alloying and hardening of metals, refinement of metals, equilibrium diagrams, characteristics of engineering metals, principles of metal fabrication.

02.432 Materials B

(Prereq. 02.431) 4 Q.H.

Inorganic materials, i.e., polymers, glasses, ceramics, cements, wood; and materials having important electrical and magnetic properties. Also a summary of the most recent applications for the fabrication and uses of both metals and nonmetals. Structures of metals, imperfections, phase diagrams, effect of temperature on structure and properties of metals, (annealing, recrystallization, recovery, precipitation, diffusion), strengthening mechanisms, mechanical properties of nonferrous metals. Laboratory: experiments in preparation of samples, selection, polishing, and etching; examination of nonferrous metals, use of the microscope, linear analysis, construction of cooling curves, and simple binary phase diagrams.

02.433 Applied Metallurgy

(Prereq. 02.432) 4 Q.H.

Lectures: mechanical properties of ferrous metals, the iron carbon diagram, high-temperature alloys, hardening methods, impact tests, effects of environment on metals. Manufacturing processes, methods of fabrication, limitations on the use of different materials and processes, casting, welding, cutting, drawing, powder metallurgy. Laboratory: experiments on analysis of stress-strain diagrams of iron and steel, heat treatment of steels, surface corrosion, tempering and drawing, use of metallograph and analysis of the results. Experiments in cold rolling, swagging, drawing of nonferrous metals and the analysis of the results. Tension, shear, fatigue, and machinability tests on ferrous metals.

02.441 Fluid Mechanics A

(Prereq. 02.412) 4 Q.H.

Hydrostatics, principles governing fluids at rest, pressure measurement, hydrostatic forces on submerged areas and objects, simple dams, fluids in moving vessels, hoop tension. Fluid flow in pipes under pressure, fluid energy, power and friction loss, Bernoulli's Theorem, flow measurement.

02.442 Fluid Mechanics B

(Prereq. 02.441) 2 Q.H.

Pipe networks and reservoir systems; flow in open channels; uniform flow; energy, friction loss, minor losses, velocity distribution, alternate stages of flow, critical flow; nonuniform flow; accelerated and retarded flow; hydraulic jump and waves.

02.451 Mechanical Vibrations

(Prereq. 02.413) 4 Q.H.

Elements of vibrating systems; one degree of freedom (undamped free and forced vibration from Newton's law of motion and energy methods). Natural frequencies. Damped free and forced vibration. Impedance and mobility. Systems with more than one degree of freedom. Influence coefficients, Lagrange's equations, generalized coordinates, vibration absorber.

02.452 Experimental Stress Analysis

(Prereq. 02.415) 4 Q.H.

Theory and experimentation showing the application of extensometers and electrical strain gages as transducers in the field of experimental stress and strain analysis. Theory and laboratory practice; photoelastic methods as applied to classical model analysis and modern coating analysis.

02.461 Machine Shop

4 Q.H.

Introduction to study of machines for metal processing, cutting tools, and fluids. Machinability; automatic machinery.

02.462 Mechanical Technology Laboratory I

(Prereq. 02.431, 02.415, or concurrently) 2 Q.H.*

Experiments concerning the physical properties of materials. Instrumentation and measurement.

02.463 Mechanical Technology Laboratory II

(Prereq. 02.462, 02.441) 2 Q.H.*

Experiments concerning compressible and incompressible fluids. Experimental techniques.

02.464 Mechanical Technology Laboratory III

(Prereq. 02.463) 2 Q.H.*

Experiments of a more advanced nature. Introduction to the analog computer and experimental stress analysis.

02.465 Heat Technology Laboratory I

(Prereq. 02.442 or concurrently) 2 Q.H.*

Experiments illustrating principles of thermodynamics and heat transfer. Instrumentation and measurement.

02.466 Heat Technology Laboratory II

(Prereq. 02.465, 02.424, or concurrently) 2 Q.H.*

Experiments on various types of heat engines. Experimental techniques.

02.467 Project Lab.

(Prereq. 02.464, 02.466) 4 Q.H.*

A project of analytical, design, or experimental nature. Must be approved by student's faculty advisor. A formal report must be submitted.

ELECTRICAL ENGINEERING TECHNOLOGY

03.311 Electronics I

(Prereq. 03.303, 11.323 or 11.320) 4 Q.H.

Vacuum, semiconductor diodes; power supplies and filters. Vacuum tubes and transistors as amplifying devices. Graphical analysis of basic amplifiers; d-c and a-c load lines. Transistor biasing techniques.

03.312 Electronics II

(Prereq. 03.311) 4 Q.H.

Small-signal low-frequency transistor models. A-c equivalent circuits; low frequency amplifier circuits. Frequency effects in audio amplifiers. High-frequency transistor model. Voltage regulation.

03.313 Electronics III

(Prereq. 03.312) 4 Q.H.

Continuation of transistor circuits. Untuned amplifiers, feedback amplifiers and oscillators, low-frequency large signal amplifiers. Field effect transistor circuits.

03.323 Electronic Laboratory

(Prereq. 03.312) 2 Q.H.*

Experiments dealing with laboratory equipment techniques, transistor and crystal-diode characteristics, the impedance bridge, the Q-Meter, coils with iron cores, filter circuits, vacuum and semi-conductor diodes, power supplies including the regulated type, triode and pentode vacuum tubes, silicon-controlled rectifiers, resistance-coupled amplifiers. Transistor usage.

03.324 Circuits Laboratory I

(Prereq. 03.306) 2 Q.H.*

Experimentation in electronic circuit theory utilizing various measurement techniques. Instrumentation verification of circuit theorems; response of circuits to steps and impulses; oscilloscope theory and applications.

03.325 Circuits Laboratory II

(Prereq. 03.324) 2 Q.H.*

Further experimentation in electrical circuits and measurement techniques. Experiments include nonlinear devices, terminal characteristics of active devices, log modulus plots, network parameters and synthesis, Fourier analysis and synthesis.

03.327 Advanced Electronic Laboratory I

(Prereq. 03.323, 03.313) 2 Q.H.*

Experiments dealing with class B audio amplifier with transistors, push-pull amplifiers, drivers, and distortion measurements. Double-tuned transformers, video amplifiers, audio-frequency oscillators, and square-wave testing of audio amplifiers.

*Including lab.

03.328 Advanced Electronic Laboratory II

(Prereq. 03.327) 2 Q.H.*

Experiments dealing with operational amplifiers. Modulation of a class C amplifier, the diode detector, basic timing circuits, RF and crystal oscillators, networks in FM and television equipment, pulse and counter circuits and frequency dividers, sawtooth generators, astable (free-running) multivibrators, logic gates, frequency modulation detectors.

03.329 Advanced Electronic Laboratory III

(Prereq. 03.328) 2 Q.H.*

Spectral studies of FM and PM waves; amplitude limiters. The balance modulators and single sideband generators. Binary adders, registers and counters, radio receiver testing, television receiver demonstration, analog computers. Pulse forming and delay lines, slotted lines, and a series of five microwave experiments.

03.410 Electrical Measurements

(Prereq. 03.454) 4 Q.H.

Measurement of voltage, current, power, resistance, capacitance, inductance, impedance, frequency, etc. Direct and substitution measurements. Evaluation of measured data, standard deviation and tolerance limits, instruments calibrations. Effects of residual impedance.

03.420 Electricity and Electronics I

(Prereq. 11.319) 4 Q.H.

Introduction to circuit analysis, resistive networks, periodic excitation function, steady state a-c circuits. The physical foundations of electronics and the physical operation of electronic devices.

03.421 Electricity and Electronics II

(Prereq. 03.420) 4 Q.H.

Single-stage electronic circuits, magnetic circuits and transformers, electro-mechanical energy conversion, d-c machines, a-c machines.

03.430 Energy Conversion

(Prereq. 03.452 and 10.422) 4 Q.H.

Generalized theory of rotating energy conversion devices. Steady state operation of the multiply excited direct-current machine. Control of speed; special machines. Steady state considerations of transformers; induction and synchronous machines. Generalized machine and circuit models, transfer functions, and flow chart analysis. Laplace transform techniques as applied to the analysis of dynamic operating modes of rotating machines.

03.437 Distributed Systems

(Prereq. 10.422) 4 Q.H.

Radiation, transmission, and reception of electromagnetic waves. Distributed constants and traveling waves of transmission lines. Differential equations of the uniform line.

03.440 Physical Electronics

(Prereq. 11.420) 4 Q.H.

Electron ballistics and applications. Properties of atoms and electrons as related to conduction of electricity in solids. Fundamentals of semiconductors, crystal diodes, and transistors. Theory of field-effect transistors, integrated circuits, and photoelectric devices.

03.451 Circuit Analysis I

(Prereq. 10.320, 11.319) 4 Q.H.

Ohm's law, Kirchoff's current and voltage laws, equivalent resistances and sources, mesh and modal analysis, network theorems, two-port networks and power relations—all with respect to direct currents. Energy storage, singularity functions; response of R, L, and C elements to singularities.

03.452 Circuit Analysis II

(Prereq. 03.451) 4 Q.H.

Complex, algebra, phasors, frequency domain, mutual inductance, transformers, steady-state a-c theory, driving point and transfer impedances, power and energy in a-c circuits. Laplace transforms; partial fraction expansion; Laplace transform techniques applied to the solution of RLC networks.

03.453 Circuits Analysis III

(Prereq. 03.452) 4 Q.H.

Application of differential equations to the solutions of linear, time-invariant electrical networks. Introduction to singularity functions, convolution, and time domain transient analysis. Network topology and duality, introduction to the methods of transformation

*Including lab.

calculus and complex frequency concepts.

03.454 Circuits Analysis IV

(Prereq. 03.453) 4 Q.H.

Signal analysis in the frequency domain. Fourier series. Fourier and Laplace transform methods. A varied selection of circuit problems are solved using Laplace transform methods. A varied selection of circuit problems are solved using Laplace transforms and related theorems.

03.460 Engineering Analysis I

(Prereq. 10.422 and 03.452) 4 Q.H.

Linear algebra and its application to circuit equations. Solution of linear differential equations, including an introduction to Laplace transforms.

03.461 Engineering Analysis II

(Prereq. 10.422) 4 Q.H.

Complex variables and their relevance to an electrical engineering program.

03.470 Digital Computers

(Prereq. 03.313 or concurrently) 4 Q.H.

Introduction to the field of digital computer design. Topics include: general computer organization, number systems and number representations, design characteristics of major computer units, Boolean Algebra applications to computer design.

03.447 Control Engineering I

(Prereq. 03.454 and 10.422) 4 Q.H.

Analysis of linear servomechanisms under both transient and steady state conditions. Signal flow graphs. Laplace transforms used in the formulation of block diagrams and transfer function.

03.478 Control Engineering II

(Prereq. 03.477) 4 Q.H.

System stability. Root locus techniques. Treatment of Nyquist criteria and Bode diagram methods for systems evaluation.

03.490 Optical Instrumentation

(Prereq. 10.308 and 10.319) 4 Q.H.

Telescopes, microscopes, and other optical instruments as optical system components. Includes magnification, aberrations, resolution criteria, photometry. Compatibility of system components and optimization of systems. The basic nonimage-forming systems used for analysis control and metrology.

CHEMICAL ENGINEERING TECHNOLOGY

04.481 Nuclear Technology

(Prereq. 10.422 and 11.319) 4 Q.H.*

Atomic and nuclear structure; discovery and nature of radioactivity. Nuclear reactions and energy, induced nuclear transformations, neutron properties, applications of radio nuclides. Radiological safety: nuclear instrumentation for particle detection, monitoring, and experimentation. The fission process and its applications; nuclear reactors—their classification design and application; nuclear fuel processing; radioactive waste disposal. Supplementary laboratory experiments.

Graphic Science

09.104 Computer Programming

2 Q.H.

A special course offered primarily for engineering transfer students covering elementary programming methods using the FORTRAN language. Emphasis is on general programming, but examples are chosen from the various branches of engineering.

Prof. Rule

Fall Qtr.

09.106 Basic Engineering

4 Q.H.

Introduction to engineering. Basic methods of communication (engineering drawing and pictorial representation). Use of the computer in engineering (FORTRAN programming). Input/output considerations, control statements including DO loops, subscripted variables.

Prof. Rule and Staff

Fall, Winter, and Spring Qtrs.

*Including lab.

09.107 Basic Engineering

(Prereq. 09.106) 4 Q.H.

Introduction to the design process. Involvement in original design projects requiring creative conceptual solutions. Review of several case studies showing the role of an engineer in problem solving. Continuation of computer programming as it applies in engineering. Use of the IBM Scientific Subroutine Package, computer graphics, numerical procedures.

Prof. Rule and Staff

Winter, Spring, and Summer Qtrs.

09.114 Introduction to Computers

2 Q.H.

A course given for biomedical majors, covering elementary aspects of FORTRAN programming as it applies to solving medical and engineering problems. Subscripted variables and nested DO loops are covered.

Prof. Rule

Winter Qtr.

09.115 Computer Programming

(Prereq. 09.114) 2 Q.H.

Higher-level programming techniques are developed, including writing of subprograms and making use of scientific subroutine packages. Graphical output using the CalComp plotter is covered.

Prof. Rule

Spring Qtr.

09.421 Principles of Computer Programming I

2 Q.H.

Rules for forming simple FORTRAN programs. Basic input/output techniques. FORMAT control. Algorithms for solving simple scientific problems. Computing large sums; maxima and minima in both discrete and continuous cases.

Prof. Rule and Staff

Fall and Winter Qtrs.

09.422 Principles of Computer Programming II

(Prereq. 9.421) 2 Q.H.

Extended capabilities of the FORTRAN language. Manipulation of vectors and arrays. Subroutine and function subprogramming. Continued applications of computers, sorting, merging, root determination. A-Format.

Prof. Rule and Staff

Winter and Spring Qtrs.

09.423 Principles of Computer Programming III

(Prereq. 9.422) 2 Q.H.

Use of scientific subroutines, simulation, random numbers. Introduction to numerical methods (solution of simultaneous equations, quadrature, derivatives). Use of plotter language. Display of information.

Prof. Rule and Staff

Spring Qtr.

09.461 Engineering Design Graphics I

2 Q.H.

Introduction to engineering drawing. Orthographic projection and primary auxiliary views. Reading and interpreting of multiview drawings. Isometric and oblique pictorial representation.

Prof. Rule and Staff

Fall and Winter Qtrs.

09.462 Engineering Design Graphics II

(Prereq. 9.461) 2 Q.H.

Emphasis on engineering drawings required to support engineering design, including standard conventions, dimensioning, and basic production processes. Shop detail drawings are covered. Exercise in design processes are given through selected projects and case studies.

Prof. Rule and Staff

Winter and Spring Qtrs.

09.463 Engineering Design Graphics III

(Prereq. 9.462) 2 Q.H.

Greater involvement in design by examination of many commonly used components. Case studies of large systems discussed in class. Advanced design projects assigned.

Prof. Rule and Staff

Spring Qtr.

Mathematics

10.100 Introduction to College Mathematics

4 Q.H.

10.101 Basic Mathematics

3 Q.H.

Development of real numbers and the algebraic operations, with emphasis placed on the field postulates. Study of polynomials, fractions, exponents, radical expressions, 1st- and 2nd-degree equations, solutions of inequalities.

Prof. Claflin

Fall Qtr.

10.102 Basic Mathematics

(Prereq. 10.101) 3 Q.H.

Functions and relations, graphs, simple forms of conic sections, variation, exponential and logarithmic functions, systems of equations and inequalities.

Pfor. Claflin

Winter Qtr.

10.103 Basic Mathematics

(Prereq. 10.102) 3 Q.H.

Complex numbers, theory of equations, sequences and series, probability.

Prof. Claflin

Spring Qtr.

10.104 Fundamentals of Mathematics

(Prereq. one unit high school algebra) 4 Q.H.

Formation of linear equations and their use as models; systems of linear equations and linear inequalities; introduction to linear programming; vectors and matrices and their use in solving linear systems of equations.

10.105 Fundamentals of Mathematics

(Prereq. 10.104 or equivalent) 4 Q.H.

Logarithms, differentiation of functions and applications of the derivative, elements of probability.

10.106 Calculus

(Prereq. 3½ units of college prep. math. or 10.103, 10.105) 4 Q.H.

A first course for upper-class students. Differential calculus for functions of one variable, topics in analytic geometry, integration, applications of differentiation and integration.

10.107 Calculus

(Prereq. 10.106) 4 Q.H.

Techniques of differentiation and integration: partial differentiation, multiple integration, applications to geometry of three dimensions.

10.108 Probability, Statistics and The Computer

4 credits for non-Science majors

Winter, Spring and Summer Qtrs.

10.120 Introduction to Computers

(For non-Math majors; no Math. prereq.) 4 Q.H.

A nontechnical introduction to computers, their abilities and shortcomings, and their impact on learning society. Some of the questions to be raised are: Can computers think? How do computers compose music, play chess and write poetry? Can computers reproduce? How does a computer work? What can be done about the data bank menace? Although this is not a course in computer programming, the student will learn to convince (i.e., program) the computer to do simple tasks for him.

Fall and Winter Qtrs.

10.124 Fundamentals of Mathematics

4 Q.H.

Study of operations involving real numbers, including factoring, exponents, functions, and quadratic equations. The course also covers matrices, determinants, and logarithms.

10.125 Fundamentals of Mathematics

4 Q.H.

Exponential and logarithmic functions; differential calculus, including definitions of derivative; power rule, chain rule, product and quotient rules; maximum and minimum theory; integral calculus, including definite and indefinite integrals; introduction to probability.

10.126 Mainstreams of Mathematics

4 Q.H.

10.140 Mathematical Analysis IV-V

(Prereq. freshman calculus or equiv.) 5 Q.H.

Designed to prepare transfer students for numerical analysis and differential equations. Linear algebra, vector-valued functions, functions of several variables, multiple integration, infinite series, Taylor's theorem, complex numbers.

10.150 Calculus

4 Q.H.

A first course in calculus of one variable, primarily for students in the College of Engineering.

Differentiation, integration, and elementary applications. Interpolation, numerical integration, first- and second- order differential equations, vectors.

10.151 Calculus

(Prereq. 10.150) 4 Q.H.

A continuation of 10.150.

10.152 Calculus

(Prereq. 10.151) 4 Q.H.

A continuation of 10.151.

10.153 Calculus

(Prereq. 10.152) 4 Q.H.

Solid analytic geometry, vectors, infinite series, partial derivatives, with applications.

Prof. Frampton

Fall and Winter Qtrs.

10.154 Calculus

(Prereq. 10.153) 4 Q.H.

Multiple integration, complex variables, with applications. Complex numbers, linear algebra, and systems of linear differential equations.

Prof. Frampton

Spring and Summer Qtrs.

10.155 Mathematical Analysis

(Prereq. 10.154) 4 Q.H.

Ordinary differential equations, with emphasis on methods of solution. Includes first-order equations, second-order linear equations with constant coefficients, and systems of first-order linear equations. (Intended primarily for engineering students.)

Fall and Winter Qtrs.

10.156 Mathematical Analysis

(Prereq. 10.155, and 9.107 or 9.105) 4 Q.H.

Part 1: Introduction to numerical analysis. The digital computer is used in root-evaluation, interpolation, and solution of differential equations.

Part 2: Fourier series and boundary value problems for partial differential equations. (Intended primarily for engineering students.)

Spring and Summer Qtrs.

10.160 Calculus for Biology Majors

4 Q.H.

A first course in calculus with inspiration from and applications to biology. Differentiation and integration of functions of one variable. Partial derivatives. Multiple integration, Taylor's formula and approximation methods.

Fall Qtr.

10.161 Calculus for Biology Majors II

(Prereq. 10.160) 4 Q.H.

Continuation of 10.160.

Winter Qtr.

10.162 Calculus for Biology Majors III

(Prereq. 10.161) 4 Q.H.

Continuation of 10.161.

Spring Qtr.

10.170 Geometry

(Prereq. a course in calculus) 4 Q.H.

Selected topics from advanced plane geometry in Euclidean style: i.e., collinear points, concurrent lines, duality, cross-ratio, harmonic division of segments, homogeneous coordinates, abridged notations, special theorems concerning points, lines, triangles, and circles (Euler, Desargues, Lemoine, Brocard, Brianchon, Feuerbach); the nine-point circle, inversion, reciprocation.

Prof. Dean

Fall and Winter Qtrs.

10.171 Geometry

(Prereq. 10.170) 4 Q.H.

Discussion of Euclid's definitions and postulates; examination in detail of the fifth postulate and other items leading to non-Euclidean geometry. Some special topics in non-Euclidean geometry of the hyperbolic and elliptic planes.

Prof. Dean

Spring and Summer Qtrs.

10.181 Calculus I

5 Q.H.

Derivatives and integrals of functions of one variable. Approximation methods including numerical integration, Newton's method, Taylor series, and power series. Brief introduction to differential equations, partial derivatives, and multiple integrals. Students will be encouraged to solve selected problems on the computer.

Prof. Gilmore

Fall Qtr.

10.182 Calculus II

(Prereq. 10.181) 5 Q.H.

Continuation of 10.181.

Prof. Gilmore

Winter Qtr.

10.183 Calculus III

(Prereq. 10.182) 5 Q.H.

Continuation of 10.182.

Prof. Gilmore

Spring Qtr.

10.184 Calculus and Linear Methods I

(Prereq. 10.183) 4 Q.H.

Methods of calculus combined with vector analysis, used to study curves, surfaces and functions of several variables. Topics include: parameterization of lines and planes, tangents and normal vectors, partial derivatives, maxima and minima problems, linear approximation, and tangent planes. Some linear algebra.

Prof. Bridger

Fall and Winter Qtrs.

10.185 Calculus and Linear Methods II

(Prereq. 10.184) 4 Q.H.

Continuation of 10.184. Multiple integration, line integrals, and exact differentials; various forms of Stokes' Theorem. More linear algebra.

Prof. Bridger

Spring and Summer Qtrs.

10.186 Differential Equations and Linear Methods I

(Prereq. 10.183) 4 Q.H.

Methods of solving first- and second-order differential equations and systems of first-order equations. Numerical solution of differential equations. The use of linear algebra is emphasized and the necessary techniques developed.

Prof. Kopell

Fall and Winter Qtrs.

10.187 Differential Equations and Linear Methods II

(Prereq. 10.186) 4 Q.H.

Continuation of systems of first-order equations, eigenvalue problems, special second-order equations (especially those which arise in physics), power series solutions, orthogonal polynomials. Fourier series and Laplace transforms if time permits.

Prof. Kopell

Spring and Summer Qtrs.

Note: As a rule, students should take 10.186 and 10.187 in parallel with 10.184 and 10.185.

10.207 Differential Equations

(Prereq. 10.183 or equiv.) 4 Q.H.

Intended primarily for chemists and industrial engineers. Topics covered include the initial-value program for first- and second-order differential equations; the two-point boundary value problem for second-order differential equations.

Spring and Summer Qtrs.

10.208 Probability

(Prereq. 10.154 or 10.185) 4 Q.H.

Probability functions for finite and infinite spaces; conditional probability and independence; discrete and continuous probability distributions for one or more random variables; expectation; moments; binomial, Poisson, and normal distributions; central limit theorem.

Prof. Stubbs

Fall and Winter Qtrs.

10.209 Advanced Probability Theory

(Prereq. 10.208) 4 Q.H.

Fall and Winter Qtrs.

10.211 Fortran and Forgo I

1 Q.H.

Introduction to computer programming via FORGO language. Development of simple

mathematical models and their solution by computers. Elementary numerical methods, flow charting.

10.212 Fortran and Forgo II (Prereq. 10.211) 1 Q.H.
Continuation of 10.211.

10.213 Fortran and Forgo III (Prereq. 10.212) 1 Q.H.
Continuation of 10.212.

10.214 Systems Programming (Prereq. consent of instructor) 4 Q.H.

10.220 Mathematical Statistics (Prereq. 10.208) 4 Q.H.
Estimation of parameters, confidence intervals, hypothesis testing, regression, sampling distributions. Introduction to analysis of variance and statistical decision theory.
Prof. Stubbs Spring and Summer Qtrs.

10.221 Applied Analysis (Prereq. 10.251 and 10.246, or equivalents) 4 Q.H.
Linear analysis, with applications to linear ordinary differential equations. Other topics in differential equations, such as separation and comparison theorems, and the Laplace transform.
Prof. Wils (Fall) and Prof. Filgo (Winter) Fall and Winter Qtrs.

10.222 Applied Analysis (Prereq. 10.222) 4 Q.H.
Linear analysis continued: orthogonal series, partial differential equations, with application to boundary-value problems in the study of mechanical vibrations and heat conduction.
Prof. Wils (Spring) and Prof. Filgo (Summer) Spring and Summer Qtrs.

10.223 Numerical Analysis (Prereq. two years of calculus, FORTRAN programming) 4 Q.H.
A computer-oriented introductory course in numerical analysis. Methods for finding numerical solutions of nonlinear equations, systems of linear equations, ordinary differential equations, curve-fitting and interpolation problems, and evaluation of definite integrals are analyzed and programmed on a digital computer.

10.224 Numerical Analysis (Prereq. 10.223) 4 Q.H.
A continuation of 10.223.

10.226 Functions of a Complex Variable (Prereq. 10.184 or equiv.) 4 Q.H.
Algebra and geometry of complex numbers. Concepts of limit, continuity, and derivative in the complex domain. Holomorphic functions, series, contour integration. Applications.
Fall and Winter Qtrs.

10.230 Linear Programming (for non-Math majors) (Prereq. one year of college mathematics) 4 Q.H.
Introduction to concepts and techniques of linear programming, game theory, stochastic processes. Applications to economics, social sciences, and other related fields.
Prof. Hajian Fall and Winter Qtrs.

10.232 Multivariate Statistics (Prereq. 10.220) 4 Q.H.
Methods of classification, estimation, and prediction based on several statistical variables.
Offered 1973-74, Spring and Summer Qtrs.

10.240 Mathematical Models in the Life Sciences (Prereq. one year of Calculus) 4 Q.H.
A course in the derivation and solution of mathematical models in the area of biology, psychology, and the social sciences. Such phenomena as population dynamics, diffusion processes, pollution, control systems, neural networks, and mathematical genetics are studied.

10.241 Mathematical Models in the Life Sciences (Prereq. 10.240) 4 Q.H.
A continuation of 10.240.

10.246 Advanced Linear Algebra I (Prereq. 10.187 or permission of instructor) 4 Q.H.
Vector spaces. Survey of main examples. Dimension. Detailed analysis of the behavior of a

linear transformation, with an emphasis on what kinds of phenomena can occur. Use of invariant subspaces and eigenvalues. Symmetric and orthogonal maps; iteration of linear maps. Linear, bilinear, and quadratic forms. Brief study of issues arising in practical computations.

Prof. Rasala

Fall and Winter Qtrs.

10.247 Advanced Linear Algebra II

(Prereq. 10.246) 4 Q.H.

Lattices and linear algebra with integer coefficients. Congruences, modular arithmetic, and finite fields. The idea of a group; groups of linear and affine transformations; symmetry groups in the plane. If time permits, additional topics are chosen from the following areas: symmetry groups in space and crystallography; group theory as applied to function theory and/or physics; group representations; coding theory.

Prof. Rasala

Spring and Summer Qtrs.

Note: Upper-level students who have not completed the 10.181-10.187 program may take 10.246-10.247. Such students should see the instructor in the course and inform him of their particular background.

10.250 Analysis I

(Prereq. 10.187 or consent of instructor) 4 Q.H.

The theoretical underpinnings of the calculus: limits, measure, continuity, and related concepts. Analysis I and II are intended to serve as a bridge between the 10.281-287 calculus sequence and the more advanced analysis courses such as 10.221-2, 10.226, and 10.264-5.

Prof. Stolzenberg

Fall and Winter Qtrs.

10.251 Analysis II

(Prereq. 10.250) 4 Q.H.

Continuation of 10.250. Once through the calculus again, armed with the concepts introduced in Analysis I.

Prof. Stolzenberg

Spring and Summer Qtrs.

10.256 Algebra

(Prereq. 10.246) 4 Q.H.

Theory of fields: field extensions, automorphisms, Galois theory. Applications to theory of equations.

10.257 Optimization and Mathematical Game Theory

(Prereq. Some linear algebra. E.g., 10.246 or consent of instructor) 4 Q.H.

Convex sets in Euclidean n -space, linear and nonlinear programming, zero-sum games, dynamic programming. Students are encouraged to program selected solution methods for a computer.

Prof. Warga

Winter and Spring Qtrs.

10.264 Recent Ideas in Geometry

(Prereq. 10.251 and 10.247 or consent of instructor) 4 Q.H.

Topics chosen by the instructor may vary each year. Topological classification of surfaces, theory of critical points and singularities of mappings, topological study of vector fields, knot theory, graph theory, differential geometry of surfaces, algebraic curves, homotopy.

Prof. Blank

Fall and Winter Qtrs.

10.265 Recent Ideas in Geometry

(Prereq. 10.264) 4 Q.H.

Continuation of 10.264.

Prof. Blank

Spring and Summer Qtrs.

10.271 Foundations of Mathematics

(Prereq. 10.250 or equivalent) 4 Q.H.

Logic and set theory.

Fall and Winter Qtrs.

To be offered alternate years.

10.272 Foundations of Mathematics

(Prereq. 10.271) 4 Q.H.

Continuation of 10.271.

Spring and Summer Qtrs.

To be offered alternate years.

10.273 History of Mathematics

4 Q.H.

Development of the various branches of mathematics; lives of outstanding mathematicians; growth of mathematical knowledge and its relation to culture.

10.274 Number Theory

(Prereq. 10.246) 4 Q.H.

The properties of positive integers, divisibility, congruences, quadratic residues, Diophantine equations.

10.281-10.289 Directed Study

(Prereq. consent of instructor)

Programs of directed study, held one or more quarters, are available for highly motivated students who wish to explore mathematical phenomena and theories more deeply. In particular, a freshman-sophomore directed study program, emphasizing discussion of concepts and independent research, runs concurrently with the calculus sequence (beginning in the winter of the freshman year). Past discussions have included these topics: measure by covering and packing, lattices, symmetry, theory of numbers, and classification of surfaces.

All Quarters

10.295, 10.296, 10.297, 10.298 Honors Program**10.307 College Algebra and Trigonometry**

(Prereq. Math. Placement Test or 10.302) 4 Q.H.

Fundamental operations of algebra, algebraic fractions, exponents and radicals, functions. Trigonometric functions of angles both in degree and in radian measure; right triangles; identities and equations.

10.308 College Algebra and Trigonometry II

(Prereq. 10.307) 4 Q.H.

Quadratic equations and applications, radical equations, complex numbers, binomial expansion, variation, roots of polynomial equations. Trigonometric graphs, other transcendental functions, logarithms, inverse trigonometric functions.

10.320 Calculus I

(Prereq. 10.308, 10.329, or 10.335) 4 Q.H.

Functions, graphs, and limits; study of the straight line, the circle, the parabola; differentiation of algebraic functions, with applications, including curve-sketching.

10.421 Calculus A

(Prereq. 10.320) 4 Q.H.

Applications of derivatives to curve-sketching, antidifferentiation, the definite integral with applications, calculus of non-algebraic functions—logarithmic, exponential, and trigonometric. Calculus of inverse trigonometric functions, techniques of integration, polar coordinates, the conic sections, vectors in a plane, indeterminate forms, L'Hopital's rule.

10.422 Calculus B

(Prereq. 10.421) 4 Q.H.

Calculus of functions of several variables, partial differentiation, multiple integrals, infinite series. Vector analysis; matrices and linear algebra.

10.423 Differential Equations

(Prereq. 10.422) 4 Q.H.

Ordinary differential equations—standard types of the first order; linear differential equations, especially with constant coefficients; Laplace transforms; series solutions of differential equations. Fourier series and orthogonal functions.

Physics

This Department rotates its teachers.

11.108 Physics in Sports

(No prereq.) 4 Q.H.

Some of the physical principles involved in sport. Topics include: sailing, skiing, baseball, tennis, gymnastics, and caloric considerations.

Spring Qtr.

11.109 Physics in Music

(No prereq.) 4 Q.H.

Explores the physical nature of modern music production and reproduction; relates the

aesthetic and physical problems encountered and treats their mutual influence. Topics include: the basics of sound production and manipulation, the physical and psychological response of the ear, musical notation, details of instrumental design, construction and operation, modern music reproduction from initial detection through living room listening, and acoustic environment.

Winter and Spring Qtrs.

11.110 Physics Laboratory for Engineering Students I 1 Q.H.*

The first quarter of a two-quarter laboratory sequence in which the student performs experiments from various fields of physics.

Fall and Winter Qtrs.

11.111 Physics Laboratory for Engineering Students II (Prereq. 11.110) 1 Q.H.*

Continuation of 11.110.

Spring and Summer Qtrs.

11.112 Physics of Fluids 3 Q.H.*

The physical properties of gases and liquids, with emphasis on their application to the health services. Force and pressure, hydrostatics, fluid flow, the ideal gas law, real gases, condensation and evaporation, surface tension, osmosis. An introduction to electricity is given if time permits.

Fall Qtr.

11.113 Physics for Criminal Justice Students I 4 Q.H.

The first quarter of a two-quarter course intended to serve both as a basis for advanced study of criminalistics and an introduction to the physical sciences for students specializing in other areas of criminal justice. A broad range of topics is covered, from ballistics to atomic and molecular structure. Emphasis is placed on physical fundamentals rather than on mathematical rigor. Examples taken from case histories are used to illustrate the application of basic physical laws in realistic crime-lab and courtroom situations. These include: calculation of bullet and blood-spatter trajectories, possible and impossible traffic violations, the cooling curve of cadavers and its relation to the time of death, the human vocal frequency spectrum and the use of "voice-prints", the optical spectrum and spectroscopic identification of materials, Doppler shift and radar speed measurements, and the relation of microscopic structure to the fracture and deformation properties of solids.

Fall and Winter Qtrs.

11.114 Physics for Criminal Justice Students II 4 Q.H.

Continuation of 11.113.

Spring and Summer Qtrs.

11.115 Physics for the Humanities Students I (Fundamentals of Physics) 4 Q.H.

The first quarter of a two-quarter sequence intended primarily for students in the humanities and social sciences. Some of the basic concepts governing the physical universe (time, space, motion) are established without using more mathematics than simple algebra. The course then proceeds to a nontechnical description of the origins of many of the interesting phenomena encountered in nature: gravity, sound, light, radioactivity. Historical, social— as well as practical— aspects of developments in physics all receive some degree of treatment in the course of study. Classroom discussion and demonstrations form an integral part of the instructional mode.

Fall and Winter Qtrs.

11.116 Physics for the Humanities Students II (Prereq. 11.115) 4 Q.H.

Continuation of 11.115.

Spring and Summer Qtrs.

11.117 Physics for Science Majors

(Prereq. a beginning calculus course concurrently.) 4 Q.H.

Mechanics: kinematics, Newton's laws, circular motion, inclined planes, conservation laws,

*Including lab.

collisions, potential energy diagrams, harmonic motion.

Fall and Winter Qtrs.

11.118 Physics for Science Majors II

(Prereq. 11.117) 4 Q.H.

Thermodynamics and relativity: kinetic theory, the First Law and work, ideal gases, heat engines, relativity.

Fall and Winter Qtrs.

11.119 Physics for Science Majors III

(Prereq. 11.117) 4 Q.H.

Waves and electricity: the wave equation in one dimension, superposition, waves in two dimensions, interference and physical optics; electrostatics, Gauss's law, potential and line integrals; Bohr atom, deBroglie waves, photoelectric effect, X-ray diffraction; charged particles in magnetic fields.

Spring and Summer Qtrs.

11.124 Physics Laboratory for Science Majors

1 Q.H.*

The first quarter of a two-quarter laboratory sequence in which students perform experiments from various fields of physics.

Fall and Winter Qtrs.

11.125 Physics Laboratory for Science Majors II

(Prereq. 11.124) 1 Q.H.*

Continuation of 11.124.

Spring and Summer Qtrs.

11.126 Physics Review

(Prereq. one year of physics) 6 Q.H.

A special review course on the material of 11.203, 11.204, 11.205, and 11.206. The course is geared to the student's actual needs. Passing is equivalent to passing 11.206.

Fall Qtr.

11.127 Physics for Science Majors IV

(Prereq. 11.119) 4 Q.H.

Electricity and magnetism: review of electrostatics, Maxwell's equations in integral form, radiation and velocity of light; DC and AC circuits, impedance, electrical oscillations and mechanical analogs, damped oscillations, resonance; geometrical optics.

Fall and Winter Qtrs.

11.128 Physics for Science Majors V

(Prereq. 11.119) 4 Q.H.

The electromagnetic force: qualitative description of molecular interaction, dipoles, van der Waals equation, real gases, condensation pV diagrams for gases, liquids, solids, crystals; angular momentum conservation, Bohr atom and quantization, Pauli principle, spin. Periodic table.

Spring and Summer Qtrs.

11.139 Physics and Established Thought

4 Q.H.

The major effects of physics on Western culture. Concepts are covered in breadth rather than in depth. Some of the major historical conflicts in Western culture are discussed and the role of physics in these conflicts developed. Students should gain a broad knowledge of the scientific method and an understanding of conflicts between science and society from the course. Topics covered include: cosmology and anthropomorphism, causality and free will, physics evolution and ESP, and physics and intuition.

Spring Qtr.

11.171 Physics for the Life Science I

(Basic Physics) 4 Q.H.

Vector addition of force, principles of statics, Newton's second law, kinetic and potential energy, pressure, static properties of fluids, fluid flow.

Fall and Winter Qtrs.

11.172 Physics for the Life Sciences II

(Prereq. 11.171) 4 Q.H.

Wave motion, sound, light, optics, static electricity, DC circuits, magnetism.

Spring and Summer Qtrs.

*Including lab.

11.173 Physics Laboratory for the Life Sciences I 1 Q.H.*

The first quarter of a two-quarter laboratory sequence that accompanies 11.171 and 11.172. The student performs experiments from various fields of physics.

Fall and Winter Qtrs.

11.174 Physics Laboratory for the Life Sciences II (Prereq. 11.171) 1 Q.H.*

Spring and Summer Qtrs.

11.175 Physics for the Life Sciences III (Prereq. 11.171) 4 Q.H.

Temperature, gas laws, properties of liquids (surface tension and osmotic pressure), properties of solids, thermal physics, Coulomb's law, atomic and nuclear physics.

Spring and Summer Qtrs.

11.176 Physics for Psychology I 4 Q.H.*

The first quarter of a two-quarter sequence intended primarily for Psychology majors. Light, sound, electricity, and magnetism are emphasized. Sufficient mechanics is introduced for understanding of the concept of energy. Topics in modern physics, such as atomic and nuclear structure and cosmology, are also discussed. The laboratory is closely coordinated with the lectures.

Fall Qtr.

11.177 Physics for Psychology II 4 Q.H.*

Continuation of 11.176.

Winter and Spring Qtrs.

11.180 The Structure of the Universe I (No prereq.) 4 Q.H.

This course aims at introducing modern ideas in astrophysics and cosmology to the student whose field of interest is nonscientific. Since the structure of the very large is often remarkably influenced by the properties of the very small, subject material ranges from the nature of the atomic nucleus to the behavior of the most distant galaxies. Topics considered include the age and origin of the universe, the expanding universe, the life cycle of stars, how stars shine, supernovas, origin of the chemical elements, formation of the solar system, galaxies. Mathematical discussion is restricted to arithmetic and elementary geometry.

Fall and Winter Qtrs.

11.181 The Structure of the Universe II (Prereq. 11.180) 4 Q.H.

Continuation of 11.180.

Spring Qtr.

11.182 Introduction to Astrophysics and Cosmology (Prereq. 11.119 or 11.205 or equivalent) 4 Q.H.

The aim of this course is to introduce current ideas in astrophysics and cosmology to the student with an elementary background in physics. Discussions include the many recent discoveries and ideas which, over the past decade, have revolutionized much astronomical thinking about the universe, cosmological theories of its origin and age, origin of stellar energy, formation and evolution of stars, supernovas, pulsars, black holes (origin and abundance of elements), quasars, structure of galaxies. Radio and high energy astronomy are discussed. Mathematical analyses are mostly at the level of elementary geometry and simple algebra.

Winter Qtr.

11.200 Intermediate Mechanics (Prereq. 11.128 or 11.205, and 10.205 or 10.145) 4 Q.H.

The first quarter of a two-quarter sequence in classical mechanics. Vector analysis, kinematics and dynamics of particle motion, generalized coordinates, and Lagrange's equations of motion.

Fall and Winter Qtrs.

11.201 Theoretical Mechanics (Prereq. 11.119) 4 Q.H.

Conservation theorems, central force motion, systems of particles, rigid body motion,

*Including lab.

Hamilton's equation.

Spring and Summer Qtrs. of odd years.

11.203 Physics for Engineering Students I

(Elementary Physics) 4 Q.H.

The first quarter of a four-quarter sequence intended primarily for engineering students. The student is assumed to be taking a four-quarter calculus sequence concurrently. The aim of the course is to give the student a working knowledge of physics. The first quarter deals with vector algebra and the dynamics of particle motion.

Fall and Winter Qtrs.

11.204 Physics for Engineering Students II

(Prereq. 11.203) 4 Q.H.

Continuation of 11.203. Conservation laws and their use in solving problems in elementary dynamics. Wave motion and vibrating systems.

Winter and Spring Qtrs.

11.205 Physics for Engineering Students III

(Prereq. 11.204) 4 Q.H.

Continuation of 11.204. Electricity and magnetism.

Spring and Summer Qtrs.

11.206 Physics for Engineering Students IV

(Prereq. 11.205) 4 Q.H.

Continuation of 11.205. Circuit theory, electromagnetic waves, light.

Fall and Winter Qtrs.

11.207 Elementary Modern Physics

(Prereq. 11.206 or 11.128) 4 Q.H.

Special relativity and quantum physics. The properties of light and the structure of atoms and nuclei. Primarily intended for Engineering and Chemistry majors.

Spring and Summer Qtrs.

11.208 Mathematical Physics

(Prereq. 11.128 or 11.206 and 10.205 or 10.145) 4 Q.H.

Review of linear algebra and vector calculus. Special functions and partial differential equations of physics. Potential theory. Functions of a complex variable.

Spring and Summer Qtrs. in even years.

11.21A (B, C, etc.) Independent Study

1 Q.H.

11.22A (B, C, etc.) Independent Study

2 Q.H.

11.23A (B, C, etc.) Independent Study

3 Q.H.

11.24A (B, C, etc.) Independent Study

4 Q.H.

All Quarters

11.211 Electricity and Magnetism I

(Prereq. 11.128 or 11.206 and 11.208 or 10.207 or 10.221) 4 Q.H.

The first quarter of a two-quarter sequence in electromagnetic theory. Maxwell's equations and their experimental basis; electrostatics and magnetostatics; the electromagnetic field in empty space; electromagnetic waves.

Fall and Winter Qtrs.

11.212 Electricity and Magnetism II

(Prereq. 11.211) 4 Q.H.

Continuation of 11.211. Energy and momentum in the electromagnetic field. Electrodynamics: the interaction of matter and the field. Radiation.

Spring Qtr.

11.220 Thermodynamics and Kinetic Theory

(Prereq. 11.128 or 11.206 and 10.205 or 10.145) 4 Q.H.

First and second laws of thermodynamics. Entropy and equilibrium. Thermodynamic potentials. Elementary kinetic theory. Statistical mechanics and the statistical interpretation of entropy.

Fall and Summer Qtrs.

11.221 Wave Motion and Optics

(Prereq. 11.119) 4 Q.H.

Harmonic and coupled oscillators, wave equation. Geometrical and physical optics: interference, diffraction, optics of solids, amplification of light: lasers.

Winter Qtr.

11.230 Modern Physics (Prereq. 11.128 or 11.207 and 10.205 or 10.145) 4 Q.H.
A review of experiments demonstrating the atomic nature of matter, the properties of the electron, the nuclear atom, the wave-particle duality, spin, and the properties of elementary particles. The course discusses, mostly on a phenomenological level, such subjects as atomic and nuclear structure, properties of the solid state, and elementary particles.

Fall and Winter Qtrs.

11.240 Quantum Mechanics I (Prereq. 11.230, 10.207) 4 Q.H.
The first of a two-quarter sequence in quantum mechanics. Observations of macroscopic and microscopic bodies. The uncertainty principle, wave particle duality, probability amplitudes, Schrodinger wave theory, and one-dimensional problems.

Fall and Winter Qtrs.

11.241 Quantum Mechanics II (Prereq. 11.240) 4 Q.H.
Continuation of 11.240. Discrete and continuous states, Schrodinger equation in three dimensions, angular momentum, general theory of quantum mechanics, applications.

Spring Qtr.

11.260 Wave Laboratory (Prereq. 11.128 or 11.206) 4 Q.H.*
A general treatment of the problems of mechanical and electromagnetic radiation as wave phenomena. The differential wave equation and its application to selected topics. Interference and diffraction theory from the standpoint of the Huygens-Fresnel and Kirchoff formulations. Selected experiments in acoustics, optics, and microwaves to illustrate these problems.

Fall and Winter Qtrs.

11.270 Intermediate Laboratory (Prereq. 11.128 or 11.206) 3 Q.H.*
Same as 11.260.

Fall and Winter Qtrs.

11.271 Electronics Laboratory (Prereq. 11.128 or 11.206) 3 Q.H.*
Electronic circuits, pulse techniques, logic circuits, the photomultiplier, atomic detectors.

Fall and Spring Qtrs.

11.272 Experimental Laboratory (Prereq. 11.271) 3 Q.H.*
Experiments investigating the atomic nature of matter, the properties of the electron, and special relativity. The work involves vacuum system techniques and machine-shop practice.

Winter Qtr.

11.273 Advanced Physics Laboratory (Prereq. 11.272) 3 Q.H.*
Special projects in modern experimental physics.

Spring Qtr.

11.281 Properties of Matter (Prereq. 10.205, 11.128, or 11.206) 4 Q.H.
The quantitative description of solids, liquids, and gases. Topics include: the kinetic theory of gases (distribution functions, collisions, viscosity, thermal conductivity, diffusion), gas imperfection, real gases, the transition to the liquid phase, amorphous and crystalline solid structure, alloys and the metallurgical phase diagram, imperfections in solids.

Summer Qtr.

11.282 Introduction to Solid State Physics (Prereq. 11.281 or 11.220) 4 Q.H.
A semi-classical treatment of the thermal, magnetic, and electrical properties of crystalline solids. Topics include: X-ray diffraction and the reciprocal lattice, elasticity and lattice vibrations, the specific heat, properties of insulators, magnetism in insulators and in metals, introduction to the band theory of metals.

Summer Qtr.

11.295, 11.296, 11.297, 11.298 Honors Program All Quarters

*Including lab.

- 11.317 Physics I (Mechanics)** (Prereq. 10.307 or concurrently) 4 Q.H.
Kinematics and dynamics of particle motion, Newton's laws, projectile and circular motion, conservation laws for momentum and energy, rotational motion, simple harmonic motion.
Fall and Winter Qtrs.
- 11.318 Physics II (Wave, Motion, Sound, Heat)** (Prereq. 11.317) 4 Q.H.
Wave motion, intensity, interference phenomena, Doppler effect, vibrating systems, temperature, heat, change of state, heat transfer, kinetic theory of gases, general gas laws, thermodynamics.
Winter and Spring Qtrs.
- 11.319 Physics III (Electricity, Magnetism, Light)** (Prereq. 11.318) 4 Q.H.
Electrostatics, magnetism, magnetic induction, induced currents, direct and alternating current circuits, properties of light, reflection, refraction, dispersion, optical systems, diffraction, polarization.
Spring Qtr.
- 11.373 Physics Laboratory I** 2 Q.H.*
Experiments from various physics topics that have been covered in 11.317 and concurrently in 11.318.
- 11.374 Physics Laboratory II** 2 Q.H.*
A continuation of 11.373, with experiments from topics in 11.318 and 11.319.
- 11.420 Physics IV (Electromagnetic Field)** 4 Q.H.
Static electric and magnetic fields. Experimental basis for Maxwell's equations. Electromagnetic waves.
Fall and Winter Qtrs.

Chemistry

- 12.101 General Chemistry** 3 Q.H.*
Introduction to the principles of chemistry, with emphasis on stoichiometry, ionic solutions, and the inorganic chemistry of biological systems.
Prof. Boig
Fall Qtr.
- 12.102 General Chemistry** (Prereq. 12.101) 3 Q.H.*
Introduction to organic chemistry, with emphasis on compounds of biological significance.
Prof. Boig
Winter Qtr.
- 12.103 General Chemistry** 5 Q.H.*
For Chemistry majors and selected students in other majors, such as Biology, Physics, etc. Stoichiometry, atomic structure, chemical bonding, acids and bases, oxidation-reduction, states of matter, solutions. Laboratory: introduction to qualitative analysis.
Prof. Roebber
Fall Qtr.
- 12.104 General Chemistry** (Prereq. 12.103) 5 Q.H.
For Chemistry majors and selected students in other majors, such as Biology, Physics, etc. Electronic structure and chemical properties, covalent bonding, coordination compounds, topics in organic chemistry, chemical equilibria, introduction to chemical thermodynamics and kinetics. Laboratory: qualitative analysis.
Prof. Roebber
Winter Qtr.
- 12.105 Analytical Chemistry** (Prereq. 12.104) 5 Q.H.*
Theory, apparatus, operations, and interpretation of observations for a broad spectrum of present-day methods of chemical analysis, including electrical, optical, gravimetric, and titrimetric techniques.
Prof. Jankowski
Spring Qtr.
- *Including lab.

12.106 General Chemistry 5 Q.H.*

For non-Chemistry majors. Basic concepts and definitions, the mole concept and chemical stoichiometry, states of matter, solutions, periodicity of elements, atomic structure, chemical bonding and reactions.

Profs. Cass and Davies Fall and Winter Qtrs.

12.107 General Chemistry (Prereq. 12.106) 5 Q.H.*

For non-Chemistry majors. Chemical kinetics and equilibria, acids and bases, elementary thermodynamics, electrolysis and electrochemistry, chemistry of representative elements, nuclear chemistry, introduction to organic chemistry.

Profs. Boig and Cass Winter, Spring, and Summer Qtrs.

12.108 Fundamentals of Chemical Sciences I 4 Q.H.

Development and discussion of important principles and concepts of the chemical sciences. Intended for students in the social sciences and humanities with minimal background in science and mathematics. The objective of 12.108-.109 is to give the non-science student an appreciation and some knowledge of the role of chemistry in our technological society and in our everyday lives.

Prof. Davies Fall and Winter Qtrs.

12.109 Fundamentals of Chemical Sciences II (Prereq. 12.108) 4 Q.H.

Continuation of 12.108. Discussion of the chemistry involved in such basic human needs as food, clothing, shelter, transportation, and energy production. Other topics (e.g., environmental problems) may be included or substituted, since students will participate in selection of topics for discussion.

Prof. Cass Spring Qtr.

12.114 General Chemistry 4 Q.H.

Primarily for engineering students. Introduction to the principles of chemistry, focusing upon the states and structure of matter and chemical stoichiometry.

Prof. Reiff Fall and Winter Qtrs.

12.115 General Chemistry (Prereq. 12.114) 4 Q.H.

Primarily for engineering students. Introduction to the principles of chemistry, focusing upon chemical equilibria and the nature of some common materials.

Prof. Reiff Winter, Spring, and Summer Qtrs.

12.118 General Chemistry Laboratory 1 Q.H.

Optional laboratory for 12.115 (General Chemistry for engineering students). Experiments pertaining to lecture material.

Prof. Reiff Winter and Spring Qtrs.

12.139 General Chemistry 4 Q.H.

For students in the College of Criminal Justice. Structure of matter; physical and chemical properties of metallic and nonmetallic elements, inorganic compounds, and alloys; stoichiometry; solids, liquids, and solutions. Laboratory experiments illustrate basic chemical principles and representative chemical reactions.

Profs. Jankowski and Howell Fall and Winter Qtrs.

12.140 General Chemistry (Prereq. 12.139) 4 Q.H.

For students in the College of Criminal Justice. Continuation of 12.139, with emphasis on application of principles. Chemical reactivity, acids and bases, oxidation-reduction, physical and chemical properties of organic compounds. Laboratory continues studies of the first quarter.

Profs. Howell and Jankowski Spring and Summer Qtrs.

12.144 Organic Chemistry (Prereq. 12.104 or 12.107) 5 Q.H.*

Nomenclature, preparation, properties, and reactions of common organic compounds.

Prof. Jones Fall and Winter Qtrs.

Including lab.

12.145 Organic Chemistry

(Prereq. 12.144) 5 Q.H.*

Continuation of 12.144.

Prof. Jones

Spring and Summer Qtrs.

12.147 Organic Chemistry

(Prereq. 12.115) 4 Q.H.*

Aliphatic compounds; preparation, properties, and reactions of the more common classes of open-chain compounds; electronic interpretation of structures and reactions; petrochemicals; synthetic resins; carbohydrates; fats; proteins.

Prof. Howell

Fall and Winter Qtrs.

12.148 Organic Chemistry

(Prereq. 12.147) 4 Q.H.*

Aromatic compounds; preparation, properties, and reactions of the more common classes of aromatic compounds; electronic interpretation of structures and reactions of aromatic compounds; dyes, commercial solvents, and important industrial products. A brief introduction to alicyclic and heterocyclic compounds.

Prof. Howell

Spring and Summer Qtrs.

12.153 Organic Chemistry

(Prereq. 12.105) 3 Q.H.

Syntheses and properties of aliphatic and aromatic hydrocarbons and their functional derivatives; correlation between the structure of organic compounds and their physical and chemical properties; electronic interpretation of organic reactions.

Prof. Viola

Fall and Winter Qtrs.

12.154 Organic Chemistry

(Prereq. 12.153) 5 Q.H.*

Continuation of 12.153.

Prof. Viola

Spring and Summer Qtrs.

12.155 Organic Chemistry

(Prereq. 12.154) 5 Q.H.*

Continuation of 12.154

Prof. Howell

Fall and Winter Qtrs.

12.161 Physical Chemistry

(Prereq. 10.152 and 11.118 or equivalent) 4 Q.H.*

Chemical thermodynamics.

Prof. Wiener

Fall and Winter Qtrs.

12.162 Physical Chemistry

(Prereq. 12.161) 4 Q.H.*

Phase equilibria, solutions, kinetic theory of gases, chemical kinetics.

Prof. Wiener

Spring and Summer Qtrs.

12.166 Physical Chemistry

(Prereq. 10.183 and 11.118 or equiv.) 3 Q.H.

Similar to 12.161, but without laboratory.

Prof. Wiener

Fall and Winter Qtrs.

12.169 Physical Chemistry

(Prereq. 12.161 or 12.166) 3 Q.H.

Similar to 12.162, but without laboratory.

Prof. Wiener

Spring and Summer Qtrs.

12.170 Physical Chemistry

(Prereq. 12.162 or 12.169) 3 Q.H.

Quantum chemistry, particles and waves, Schroedinger wave mechanics, the chemical bond.

Prof. Giessen

Fall and Winter Qtrs.

12.171 Analytical Chemistry

(Prereq. 12.107 or equiv.) 4 Q.H.*

Theories, principles, and application of volumetric, gravimetric, and instrumental methods of analysis.

Prof. Spinos

Winter and Spring Qtrs.

12.180 Ocean Chemistry

(Prereq. 12.105, 12.171, or equiv.) 4 Q.H.*

Principles and practices of chemical and instrumental methods in current use in marine investigations, with emphasis on procedures, apparatus, and interpretation of experimental observations. Laboratory exercises include: chlorinity and salinity measurements, biological

*Including lab.

oxygen demand, trace nutrient measurement, carbonate alkalinity, heavy metal pollutants, and selected projects.

Prof. Jankowski

Spring Qtr.

12.181 Instrumental Analysis

(Prereq. 12.105 or 12.171) 3 Q.H.

Theory, procedures, operations, and apparatus used in instrumental analysis, with emphasis on interpretation of results from typical scientific investigations. Current practices in the following methods are included: atomic absorption, ultraviolet and infrared absorption, voltammetry, anodic stripping, coulometry, gas chromatography, high-speed liquid chromatography, radiotracer techniques, and neutron activation analysis.

Prof. Jankowski

Fall and Winter Qtrs.

12.185 Inorganic Chemistry

(Prereq. 12.105) 2 Q.H.

Atomic properties of free atoms and ions. Ionic bonding and the structure of the solid state. The Madelung calculation; the Born-Haber and other thermodynamic cycles. Valence-bond and molecular orbital theories of bonding. Stereochemistry of compounds of representative elements. Electron-deficient compounds.

Prof. Davies

Spring and Summer Qtrs.

12.189 Biochemistry Laboratory II

(Prereq. 93.151 or equiv.) 2 Q.H.*

Special projects in biochemical experimentation.

Staff

Spring and Summer Qtrs.

12.200 Principles of Experimental Chemistry

(Prereq. 12.166) 2 Q.H.

Instrumentation, measurements, and evaluation. Basic electronics and optics, statistical methods, computer techniques.

Prof. Keller

Spring and Summer Qtrs.

12.201 Integrated Chemistry Laboratory I

(Prereq. 12.166) 2 Q.H.*

Procedures and techniques, experiments in basic electronics and optics, vacuum system design, and data processing.

Prof. Keller

Spring and Summer Qtrs.

12.202 Integrated Chemistry Laboratory II

(Prereq. 12.201) 3 Q.H.*

Integrated experiments in inorganic, analytical, and physical chemistry; compound preparation, characterization, and property studies.

Prof. Keller

Fall and Winter Qtrs.

12.213 Advanced Inorganic Chemistry

(Prereq. 12.170) 4 Q.H.

Periodic properties of representative elements and their compounds. General theories of acid and base behavior. Spectral and magnetic properties of transition metal compounds. Crystal field and molecular orbital theories of bonding. Kinetics and thermodynamics of reactions of transition metal compounds.

Prof. Davies

Spring and Summer Qtrs.

12.252 Advanced Organic Chemistry I

(Prereq. 12.155 or 12.145) 3 Q.H.

Organic structure and reactions. Corresponds to graduate course 12.861.

Staff

Fall Qtr.

12.253 Identification of Organic Compounds

(Prereq. 12.155) 3 Q.H.*

Qualitative analysis of organic compounds and mixtures, using physical, chemical, and instrumental methods.

Prof. Howell

Spring and Summer Qtrs.

12.254 Advanced Organic Chemistry II

(Prereq. 12.155 or 12.145) 3 Q.H.

Organic structure and reactions. Corresponds to graduate course 12.862.

Staff

Winter Qtr.

12.255 Advanced Organic Chemistry III

(Prereq. 12.252 or 12.254) 3 Q.H.

Organic structure and properties. Corresponds to graduate course 12.863.

Staff

Spring Qtr.

*Including lab.

- 12.257 Advanced Analytical Chemistry I** (Prereq. 12.181) 3 Q.H.
Analytical separations. Corresponds to graduate course 12.821.
Prof. Karger Fall Qtr.
- 12.258 Advanced Analytical Chemistry II** (Prereq. 12.181) 3 Q.H.
Electronanalytical. Corresponds to graduate course 12.822.
Prof. Keller Winter Qtr.
- 12.259 Advanced Analytical Chemistry III** (Prereq. 12.181) 3 Q.H.
Optical methods of analysis. Corresponds to graduate course 12.823.
Prof. Jankowski Spring Qtr.
- 12.262 Advanced Physical Chemistry I** (Prereq. 12.170) 3 Q.H.
Chemical thermodynamics. Corresponds to graduate course 12.881.
Prof. Roebber Fall Qtr.
- 12.263 Advanced Physical Chemistry II** (Prereq. 12.170) 3 Q.H.
Atomic and molecular structure. Corresponds to graduate course 12.885.
Staff Winter Qtr.
- 12.264 Advanced Physical Chemistry III** (Prereq. 12.170) 3 Q.H.
Chemical kinetics. Corresponds to graduate course 12.893.
Prof. Roebber Spring Qtr.
- 12.271, 12.272, 12.273,** (each) 3 Q.H.
12.274, 12.275, 12.276 Undergraduate Research (each) 4 Q.H.
Original experimental work under the direction of a staff member. Participation may begin in the middler year and will normally continue through the senior year. Approval of the administrating committee is required.
Staff All Quarters
- 12.284 Advanced Chemical Synthesis** (Prereq. 12.155) 3 Q.H.*
Special projects in the synthesis of organic and/or inorganic compounds, using advanced techniques.
Prof. Howell Fall and Winter Qtrs.
- 12.286 Advanced Chemical Measurements** (Prereq. 12.163 and 12.179) 3 Q.H.*
Laboratory problems in analytical and/or physical chemistry.
Prof. Keller Fall and Winter Qtrs.
- 12.288 Special Topics** (Prereq. 12.163) 4 Q.H.
Staff Spring Qtr.
- 12.291, 12.292, 12.293, 12.294 Honors Program** (each) 4 Q.H.
All Quarters

Earth Sciences

- 16.104 Introduction to Earth Science** 4 Q.H.
Considers both the lithosphere and hydrosphere of the earth. The forces and factors producing changes in these environments are examined in some detail and are applied to an understanding of the earth's historical development.
Staff Fall and Winter Qtrs.
- 16.105 Introduction to Earth Science** (Prereq. 16.104) 4 Q.H.
A continuation of 16.104. Consideration of the gaseous envelope surrounding the earth and the meteorological phenomena occurring within it is followed by a study of the earth as an astronomical body. Particular emphasis is placed on the behavior of the earth as a member of

*Including lab.

the solar system. Staff	Winter and Spring Qtrs.
16.121 Natural History I	4 Q.H.*
A framework is developed for investigating the factors of the natural world. Concepts of ecology are employed to examine the niche, habitat, biome, and realm. Content centers about the current season and the season to follow. Laboratory is structured to develop comprehension of and facility with the course materials and their adaptation to the educational process. Prof. Wilmarth	Fall and Winter Qtrs.
16.122 Natural History II	(Prereq. 16.121) 4 Q.H.*
A continuation of Natural History I. Content is concerned with the remainder of the calendar year. Greater emphasis is placed upon dealing with the natural world by direct confrontation through field trips. Field exercises and personal research. Prof. Wilmarth	Spring and Summer Qtrs.
16.125 Environmental Conservation	4 Q.H.
Problems relating to the use and preservation of the earth's environment. Both renewable and non-renewable resources will be considered, with special emphasis given to urban environmental problems. Profs. Overcash and Ruggles	All Quarters
16.131 Oceanography I	4 Q.H.*
The geology of the ocean basins; the physical and chemical properties of sea water; the development of ocean currents and their important effects on the land masses of the world. Prof. Gordon	Fall, Winter, and Spring Qtrs.
16.132 Oceanography II	4 Q.H.*
The productivity of animal and plant life in the various zones of the ocean; the growing economic importance of the oceans as a source of food for the expanding world population. Prof. Gordon	Fall, Winter, and Spring Qtrs.
16.133 Geology of Eastern United States	4 Q.H.
The systematic study of the geomorphic provinces in the Appalachian and interior regions of the United States. Emphasis on the structure, types of landforms, and geologic history of each province. Prof. Ruggles	Fall and Winter Qtrs.
16.134 Geology of Western United States	4 Q.H.
The systematic study of the geomorphic provinces in the Rocky Mountains and Pacific Coast Ranges of the United States. Emphasis on the structure, types of landforms, and geologic history of each province. Prof. Ruggles	Spring and Summer Qtrs.
16.161 Observational Astronomy	4 Q.H.
An introduction to the night sky as seen by the naked eye and with simple optical aids. The location and identification of constellations, major stars, planets, comets, and meteors. Three telescopic viewing sessions are held. Prof. Overcash	Winter and Spring Qtrs.
16.180 Physical Geography I	4 Q.H.
Constructed to promote an understanding of man's physical environment, with concentration of study upon weather, climate, and vegetation on a world-wide scale. Prof. Allen and Mr. Casarjian	Fall and Winter Qtrs.
16.182 Physical Geography II	(Prereq. 16.180) 4 Q.H.
An interpretative description and analysis of landforms and soils. Emphasis on an examination of landform development and distribution. Prof. Allen and Mr. Casarjian	Winter and Spring Qtrs.
Including lab.	

16.183 Regional Geography of Africa

4 Q.H.

Regional analysis of historical, economic, political, cultural, and physical aspects of geography. A comparative case study approach is utilized in order to accent regional differences.

Mr. Casarjian

Fall Qtr.

16.184 Regional Geography of Latin America

4 Q.H.

Regional analysis of historical, economic, political, cultural, and physical aspects of geography. Population geography is also examined. Problems in tropical development are studied by means of a comparative case study approach.

Mr. Casarjian

Winter Qtr.

16.186 Applied Climatology

(Prereq. 16.180) 4 Q.H.

The individual elements of climate are synthesized into climatic types and regions. Climatic classifications are employed as vehicles for describing the distribution of climates. Microclimatology and applied climatology and human dimensions of weather modification are introduced.

Mr. Casarjian

Spring Qtr.

16.187 Urban Geography

4 Q.H.

Geographic structures and functions of individual cities are elaborated and the factors which determine those structures studied. Theory of city systems is developed in detail and the modern megalopolitan forms explained. Processes and problems of city growth are investigated and an attempt made to consolidate the variety of explanations for them.

Prof. Allen

Winter Qtr.

16.201 Physical Geology

4 Q.H.

A systematic study of the materials comprising the earth. Topics emphasized include the processes by which rock is formed, transported, altered, and destroyed, as well as the nature and development of landscape.

Staff

Fall and Winter Qtrs.

16.202 Historical Geology

(Prereq. 16.201) 4 Q.H.*

The physical and biological history of the earth is traced through geologic time. Major topics are the origin and evolution of life, mountain building, and continental drift.

Prof. Bailey

Winter and Spring Qtrs.

16.203 Physical Geology Laboratory

(Prereq. 16.201 or concurrently) 1 Q.H.*

Optional laboratory for Physical Geology 16.201. Laboratory exercises pertain to mineral and rock identification and topographic and geologic map interpretation. Required for Geology majors.

Staff

Fall and Winter Qtrs.

16.204 Historical Geology Laboratory

(Prereq. 16.202 or concurrently) 1 Q.H.*

Introduction to fossil representatives of major invertebrate phyla; application of fossils to studies of rock sequences; and interpretation of geologic history from geologic maps.

Prof. Bailey

Winter and Spring Qtrs.

16.211 Descriptive Mineralogy

(Prereq. 1yr. chemistry) 4 Q.H.*

An introduction to the study of mineralogy, including crystallography, and physical, chemical, and descriptive mineralogy of the common rock-forming minerals.

Prof. Westerman

Fall and Winter Qtrs.

16.212 Optical Crystallography

(Prereq. 16.211) 4 Q.H.*

Both the theory and the practical methods of optical crystallography are studied, including the basic techniques for determining the optical constants of crystals using the polarizing microscope and immersion media.

Prof. Westerman

Spring and Summer Qtrs.

*Including lab.

16.213 Optical Mineralogy

(Prereq. 16.212) 4 Q.H.*

The identification of the common rock-forming minerals using the petrographic microscope and rock-thin sections, including an introduction to mineral phase relationships.

Prof. Westerman

Fall and Winter Qtrs. beginning

September 1974

16.216 Igneous and Metamorphic Petrology

(Prereq. 16.213) 4 Q.H.*

The evolution of crystalline rocks and their distribution in time and space, including the physical and chemical factors in igneous and metamorphic processes.

Prof. Westerman

Spring Qtr.

16.221 Stratigraphy and Sedimentation

(Prereq. 16.202) 4 Q.H.*

The lithologic properties and stratigraphic relationships of sedimentary rock. Sedimentary processes, facies, and provinces of deposition are considered in conjunction with the collecting and evaluating of stratigraphic data. Classic stratigraphic sequences are reviewed, with emphasis on the general stratigraphic principles which they illustrate.

Prof. Bailey

Spring Qtr.

16.222 Sedimentary Petrology

(Prereq. 16.212) 4 Q.H.*

The origin, classification, petrography, and environment of deposition of all important types of sedimentary rocks. Laboratory work is concerned with the study and interpretation of sedimentary rocks in thin section.

Prof. Bailey

Fall Qtr.

16.231 Glacial and Pleistocene Geology

(Prereq. 16.202) 4 Q.H.

The processes of ice movement and the characteristics and distribution of erosional and depositional structures which are associated with past and present glaciers. Introduction to Pleistocene chronology and correlations.

Prof. Newman

Spring Qtr.

16.232 Geomorphology

(Prereq. 16.201) 4 Q.H.

The origin and evolution of landscape features by processes operating at or near the earth's surface.

Prof. Allen

Fall Qtr.

16.233 Coastal Processes

(Prereq. 16.201) 4 Q.H.

The effect of nearshore marine processes and the resultant coastal responses. The dynamics of waves and currents and the associated erosion, transportation, and deposition of sediment forming beaches, barrier islands, and cliffed structures.

Prof. Allen

Spring Qtr., odd-numbered yrs.

16.234 Fluvial Processes

(Prereq. 16.201) 4 Q.H.

A study of streams: their hydraulics, erosion, transportation, and deposition of sediment, channel shape and pattern, and drainage basin analysis.

Prof. Allen

Spring Qtr., even-numbered yrs.

16.241 Structural Geology

(Prereq. 16.201) 4 Q.H.*

The fundamentals of rock structure and the mechanics of rock deformation. Folds, faults, joints, and cleavage, and their importance in geological interpretation. Analysis of structures in the field. Laboratory work consists of three-dimensional problems involving structural concepts.

To be announced

Winter Qtr.

16.246 Field Geology

(Prereq. 16.201) 4 Q.H.*

An introduction to field techniques as a working guide for the approach, pursuit, and solution of geologic problems. Among the techniques considered are geologic map construction, stratigraphic section measurement, and field rock description. The laboratory consists of field research at a quarry, roadcut, or other geologic exposure.

Profs. Bailey and Newman

Summer Qtr.

*Including lab.

16.251 Paleontology

(Prereq. 16.202) 4 Q.H.*

Survey of important invertebrate phyla preserved in the geologic record. Correlation, evolution, paleoecology, and other biologic concepts are applied to fossil organisms.

Prof. Bailey

Winter Qtr.

16.261 Advanced General Geology

(Prereq. 16.201, 16.202) 4 Q.H.

An introduction to new and advanced concepts, theories, and hypotheses in geology. Students participate actively in discussions, research papers, and individual projects. Topics may include: continental drift, sea floor spreading, uniformitarianism, peneplanation, evolution, origin of magma, and origin and geologic history of the moon.

Prof. Bailey and Newman

Summer Qtr.

16.271 Geology Seminary

(Prereq. major in Geology or senior status) 4 Q.H.

An in-depth study, on an individual or small-group basis, of a selected geologic topic. Both oral and written presentations are required.

Staff

Spring Qtr.

16.281, 16.282, 16.283, 16.284 Field Trip

(Prereq. 16.141) 1 Q.H. each

A three- to six-day field trip in eastern North America, providing exposure to various rock types, geologic structures, and fossil collecting. Field notes and summary report required of all participants; additional fee of \$25 to \$50 charged.

Staff

Fall and Spring Qtrs.

16.287, 16.288 Undergraduate Research

4 Q.H. each

Independent research on a selected topic under the direct supervision of a faculty member. Open only to juniors and seniors majoring in Geology, with the recommendation of the supervising faculty member and the department.

Staff

All Quarters

16.290, 16.291 Directed Study

4 Q.H. each

Independent study of a specific topic not normally contained in the regular course offerings, but within the area of competence of a faculty member. Open to all students with the recommendation of a faculty member and departmental approval.

Staff

All Quarters

16.295, 16.296, 16.297, 16.298 Honors Program

4 Q.H. each

Staff

All Quarters

Biology

18.114 Functional Human Anatomy I

5 Q.H.*

Introduction to cellular and tissue structure and function, followed by anatomical terminology. Histology, anatomy, and physiology of bones, muscles, blood. Hemodynamics and principles of circulation. The laboratory includes a study of human bones, cat dissection, and related histology.

Fall and Winter Qtrs.

18.115 Functional Human Anatomy II

(Prereq. 18.114) 5 Q.H.*

Anatomy and physiology of the respiratory, digestive, urogenital, and nervous systems. Physiology of endocrine system and a brief anatomy and physiology of eye and ear. The laboratory includes studies of muscle and nerve physiology, blood physiology and histology, and physiology of respiration.

Winter, Spring, and Summer Qtrs.

18.117 Human Biology

4 Q.H.*

General biological principles applied to and illustrated by the human species; human cellular structure and basic metabolic processes; human genetics, human reproduction, human

*Including lab.

evolution, human ecology and interactions with other species of plants and animals.
Winter Qtr.

18.118 Organic Evolution 4 Q.H.
The major features of organic evolution, with emphasis on vertebrate evolution, genetics, and physical influences.
Prof. Moyer Spring and Summer Qtrs.

18.119 Environment and Man 4 Q.H.
An ecological analysis of the human situation and of man's interaction with other organisms. The necessary foundation of biological principles will be presented.
Staff Fall and Winter Qtrs.

18.120 Basic Microbiology 4 Q.H.*
Microbial life, emphasizing morphological characteristics, physiological activities, and disease production.
Staff Fall, Winter, and Spring Qtrs.

18.123 Biology of Human Reproduction (no prereq.) 4 Q.H.
Structure and function of male and female reproductive systems; factors affecting sexual development, fertility, and reproductive behavior in the human species. Physiology of coitus, fertilization, pregnancy, birth, and lactation. Methods of controlling fertility; some consideration of eugenics and the world population problem.
Winter Qtr.

18.124 Introductory Seminar in Biology 1 Q.H.
Seminar for students who plan to major in Biology. To be taken concurrently with 18.131, General Biology. Classic and modern original research papers are studied for insight into the rationale, methodology, and conclusions of biological research.
Fall and Winter Qtrs.

18.125 Human Physiology (Prereq. 18.141, 18.142 or equiv.) 3 Q.H.*
Physical and biochemical activities of blood corpuscles, nerve and muscle fibers; functions of the nervous system, heart, and endocrines.
Fall and Winter Qtrs.

18.126 Human Physiology (Prereq. 18.125) 3 Q.H.*
Respiration and circulation; functions of the blood, lymph, kidneys; nutrition and digestion; sensory physiology and physiologic aspects of reproduction.
Spring and Summer Qtrs.

18.131 General Biology 4 Q.H.*
Universal properties and processes of living organisms. Cellular composition and cellular activities, inheritance and cellular control, the evolutionary process environmental relationships.
Staff Fall and Winter Qtrs.

18.132 Animal Biology (Prereq. 18.131) 4 Q.H.*
Systematic comparative study of the structure and functions of animals. Diversity of animals considered from the standpoint of evolutionary adaptation.
Staff Winter, Spring, and Summer Qtrs.

18.133 Plant Biology (Prereq. 18.131-18.133) 4 Q.H.*
Systematic study of the structure and function of plants, principally vascular. Survey of the plantlike protists and monorans.
Staff Fall and Winter Qtrs.

18.134 Environmental and Population Biology (Prereq. 18.131-18.133) 4 Q.H.*
Detailed consideration of the physico-chemical factors influencing and influenced by organisms. Interactions among individual organisms and among species. Change of species
Including lab.

by genetic natural selection.
Prof. Ruber

Spring and Summer Qtrs.

18.135 Genetics and Development Biology

(Prereq. 18.131-18.133) 4 Q.H.*

Elaboration of the classic laws of heredity. Cytogenetics. Chemical basis of heredity. Selected examples of the development of form and function.

Profs. Moyer and Dealy

Fall and Winter Qtrs.

18.136 Cell Biology

(Prereq. 18.131-18.133) 4 Q.H.*

Basic chemical and physical processes of cells related to their fine structure; oxidative and intermediary metabolism; photosynthesis; membrane phenomena; movement.

Prof. Goolsby

Spring and Summer Qtrs.

18.141 Basic Animal Biology

4 Q.H.*

Principles of biology. Universal properties and processes of living organisms as exemplified by the cell and its activities. Inheritance, evolution, and environmental relationships.

Staff

Fall and Winter Qtrs.

18.142 Basic Animal Biology

(Prereq. 18.141) 4 Q.H.*

Structure and function of organ systems and animals. Diversity of animals considered from the evolutionary standpoint.

Staff

Winter, Spring, and Summer Qtrs.

18.145 Human Anatomy and Physiology I

4 Q.H.*

Lecture—structure of the human organ systems. Physiology of muscle and of the nervous system; control of voluntary movement, autonomic control, sensation. Laboratory—anatomy, based on dissections of a representative mammal and comparison with human models; microscopic anatomy of selected organs.

Winter Qtr.

18.146 Human Physiology II

(Prereq. 18.145) 4 Q.H.*

Lecture—human physiology based on the concept of the homeostatic state; functions of the blood and circulatory system, immunity, digestion, nutrition, respiration, excretion, reproduction, endocrine controls of the preceding processes. Laboratory—experiments demonstrating selected physiological phenomena in humans or in representative animals.

Spring Qtr

18.148 Human Anatomy

4 Q.H.*

The structure and development of the human body.

Prof. Shukri

All Quarters

18.158 Vertebrate Physiology

(Prereq. 18.131-18.133, 18.136) 4 Q.H.*

Properties of living protoplasm; the general organization and function of cells; translocation of materials and the organization of animals; the physiology of the skeletal systems of man and animals; the physiology of amoeboid, ciliary and contractile movement with emphasis on muscle metabolism; the structure and function of neurons, reflex arcs, the autonomic nervous system, and the sensory receptors.

Prof. Pearincott

Fall and Winter Qtrs

18.159 Vertebrate Physiology

(Prereq. 18.158) 4 Q.H.*

Fluid media of animals, emphasizing water and electrolyte balance and kidney function in many; the physiology of blood, including its formation, functions, clotting, antigens and tests for identifying blood; the physiology of the heart, nervous control of the vascular system breathing and gas transport, heat regulation, nutrition, digestion and assimilation; the endocrine secretions, and the physiologic aspects of reproduction.

Prof. Pearincott

Spring and Summer Qtrs

18.208 Comparative Vertebrate Anatomy

(Prereq. 18.131 and 18.132) 5 Q.H.*

Morphology and phylogeny of the vertebrates; laboratory studies on taxonomy of the group

*Including lab

and specific morphology of the dogfish shark, the mud puppy, the alligator and the cat.
 Prof. Ahlberg Spring and Summer Qtrs.

18.209 Embryology (Prereq. 18.131, 18.132, 18.135) 5 Q.H.*
 Gametogenesis, fertilization, cleavage, gastrulation, induction, organogenesis, and metamorphosis in vertebrates. Emphasis on frog, chick, and pig in the laboratory.
 Prof. Ahlberg Fall Qtr.

18.210 Invertebrate Zoology (Prereq. 18.131-18.135) 5 Q.H.*
 The invertebrate animals exclusive of the protozoans and insects.
 Prof. Morse Fall and Winter Qtrs.

18.211 Parasitology (Prereq. 18.131, 18.136) 4 Q.H.*
 Symbiotic relationships of protozoans, mesozoans, flatworms, nematodes, acanthocephalans, and arthropods.
 Profs. Morse, Riser, and Meszoely Fall and Winter Qtrs.

18.212 Vertebrate Paleontology (Prereq. 18.131, 18.132, 18.134, 18.135 or permission of the instructor) 4 Q.H.*
 Evolution of the vertebrates, including man, as revealed through the fossil record. Laboratory, museum, and field studies.
Spring Qtr.

18.220 General Microbiology (Prereq. or Coreq. 18.135, 18.136 or permission of the instructor) 5 Q.H.*
 Basic detailed structure and function of microorganisms and their interaction with their environments based on current knowledge and theory.
 Staff Fall, Spring, and Winter Qtrs.

18.227 Animal Histology (Prereq. 18.132) 4 Q.H.*
 Microscopic study of fundamental types of animal tissues.
 Prof. Pearincott Fall Qtr.

18.228 Histological Technique (Prereq. 18.131, 18.136) 3 Q.H.*
 General methods of tissue preparation for purposes of microscopic study; preparation of solutions and stains; the microtome and its operation, together with specific directions for fixation, clearing, hardening, embedding, section-cutting, and staining of tissues.
 Profs. Riser and Morse Spring Qtr.

18.231 Lower Plants (Prereq. 18.133) 4 Q.H.*
 Systematic morphology and life cycles of monera and plantlike protista.
 Prof. Barkley Winter Qtr.

18.232 Higher Plants (Prereq. 18.133) 4 Q.H.*
 Systematic morphology of the metaphyla.
 Prof. Barkley Winter Qtr.

18.233 Systematic Botany (Prereq. 18.133) 4 Q.H.*
 Prof. Barkley Spring Qtr.

18.234 Plant Anatomy (Prereq. 18.133) 4 Q.H.*
 Comparative developmental anatomy of seed plants.
 Prof. Joshi Spring Qtr.

18.235 Economic Botany (Prereq. 18.133) 4 Q.H.*
 Structure, distribution, and cultivation of economic plants, food, and medicinal plants, including those producing fibers, sugars, starches, rubber, gums, spices, and beverages.
 Prof. Khudairi Winter and Summer Qtrs.

18.236 Horticulture (Prereq. 18.133 or equiv.) 4 Q.H.*
 Basic cultivation methods for ornamental and food plants. Offered evenings at the University

*Including lab.

Greenhouse.
Prof. Khudairi

Spring Qtr.

18.237 Introduction to Plant Physiology

(Prereq. 18.133) 5 Q.H.*

Physiological processes in plants at the cellular and organ levels including water relations, mineral nutrition, photosynthesis, respiration, protein and fat synthesis, growth, plant hormones, and development.

Prof. Khudairi

Fall Qtr.

18.239 Terrestrial Ecosystems of North America

(Prereq. 18.133 or permission of instructor) 4 Q.H.*

The major ecosystems of North America are examined with emphasis on species diversity, productivity, origin, history and geographical location. Primary emphasis is placed upon vegetation. Field trips are required, and will be arranged with students after the first class meeting.

Spring Qtr.

18.240 Microbial Physiology

(Prereq. 18.220 or equiv.) 4 Q.H.*

The biochemical changes brought about through microbial activities; measurement of metabolic biosynthesis and degradation, rates of reaction and determination of end products.

Prof. Rosenberg

Fall and Winter Qtrs.

18.242 Medical Microbiology

(Prereq. 18.220 or equiv.) 4 Q.H.*

The bacterial cell as a pathogen, stressing major genera of disease-producing organisms and factors influencing virulence.

Prof. Gabliks

Winter and Spring Qtrs.

18.245 Serology—Immunology

(Prereq. 18.220 or equiv.) 3 Q.H.

Current concepts concerning specific and nonspecific factors of resistance to microbial disease. Chemical and biological considerations of antigens and antibodies.

Prof. Gainor

Winter Qtr.

18.246 Serology—Immunology Laboratory

(Prereq. or Coreq. 18.245) 2Q.H.*

Laboratory studies of procedures employed in biological research. Antibodies will be produced and qualitative and quantitative approaches to agglutination, precipitin, agar diffusion and other tests will be studied.

Prof. Gainor

Winter Qtr

18.251 Comparative Animal Physiology

(Prereq. 18.132, 18.136 or equivs.) 4 Q.H.*

Study of animal functions, their control, and their adaptiveness to various environments. Consideration of phylogeny of these adaptations and of their underlying cellular mechanisms. Emphasis on invertebrates and lower vertebrates, with comparisons to mammals.

Prof. Werntz

Winter Qtr.

18.280 Senior Seminar

(Prereq. completion of core biology program, 18.131—18.136) 1 Q.H.

Recent developments in various topics of zoology, microbiology, physiology, botany, ecology, genetics, and cell biology. Student presentation and analysis is emphasized. Limited to qualified juniors and seniors in the B.A. program and required of seniors in the B.S. program.

Fall, Winter, and Spring Qtrs.

18.290, 18.291 Directed Study

(Prereq. completion of core biology program, 18.131-18.136) (each) 2 Q.H.

Independent work on a chosen topic under the direction of members of the Department. Limited to qualified juniors and seniors with approval of the Department and special arrangements with the supervising faculty member. The two quarters of this course together are counted as 1 elective course in the Biology Department.

Staff

All Quarters

*Including lab.

Psychology

The rapid expansion in the number of psychology course offerings, planned to meet the needs and interests of an increased student group, results in the listing of new courses in this catalog (denoted **N**) which will be given for the first time during the 1973-75 academic years. For specific scheduling information, students should request a current course listing at the Psychology Department Main Office, 440 UR.

Students should note that course numbers below are sometimes presented out of numerical sequence, to reflect subject areas and levels of study most clearly.

INTRODUCTORY COURSES (Liberal Arts curriculum)

19.105 Foundations of Psychology I

4 Q.H.

The basic principles of psychological analysis are taught by a personalized interactive method, using videotapes, progress quizzes, one-to-one study tutorials, and optional small-group discussions. The student can study at his/her own pace, within flexible calendar limits, and class hours are not preassigned.

All Quarters

19.106 Foundations of Psychology II

(Prereq. 19.105) 4 Q.H.

The personalized method of 19.105 is extended, featuring a sequence of graded reading assignments and tutorial sessions, with frequent self-evaluation of study progress. Topics include: the analysis of behavior as applied to education, personality and behavior disorders, brain damage and language, sensory processes, ethology and aggression.

All Quarters

QUANTITATIVE METHODS

19.120 Statistics in Psychology I

(Prereq. 19.105) 4 Q.H.

A "self-paced" course in the manner of 19.106, Stat. I features a tutorial system that encourages the most advanced students to join in the teaching process by working as "peer-tutors" with the rest of the class. Students achieve a mastery of basic descriptive statistical measures. A sequence of carefully constructed work-problems is supplemented by progress checks, tutorials, and small-group review sessions.

19.121 Statistics in Psychology II

(Prereq. 19.120) 4 Q.H.

Students achieve mastery of the techniques for evaluating statistical data and the conclusions drawn from such data. Course format follows 19.120.

All Quarters

19.125 Quantitative Methods

(Prereq. 19.121, math elective) 4 Q.H.

Students achieve proficiency in using quantitative tools to solve problems in different areas of psychology. Topics include: graphical methods and logarithms, calculators and slide rules, flow charting, key punching, computer programming in FORTRAN, FOCAL and PAL languages, and simplified discussions of information theory, Fourier analysis, signal detection theory, matrix notation, and computer simulations of psychological systems.

19.126 Advanced Quantitative Methods Seminar

(Prereq. 19.125) 4 Q.H.

This seminar is concerned with the rationale that lies behind psychological measurements, and with the derivation of mathematical models that are used to interpret and validate these measurements. **N**.

LEARNING, BEHAVIOR ANALYSIS, BEHAVIOR MODIFICATION

19.160 Experimental Psychology I

(Prereq. 19.106, 19.120) 4 Q.H.

Concentration upon the experimental method in the design, execution, analysis, and

reporting of psychological investigations. Includes laboratory experiments with human and animal subjects.

19.161 Experimental Psychology II

4 Q.H.

Now replaced by 19.165.

19.164 Learning and Motivation

(Prereq. 19.106, 19.120) 4 Q.H.

This course features the application of basic behavioral principles to behavioral development, behavior modification, language development, and programmed learning, and their relations to theoretical considerations in the learning process. **N**.

19.165 Learning Laboratory

(Prereq. 19.160 or 19.164) 4 Q.H.

Through direct experience, students gain proficiency in the laboratory analysis of behavior, and in evaluating common generalizations about human behavior. Students design and perform experiments in animal and human learning, memory, decision processes, concept formation, and other topics of individual interest. **N**.

19.166 Programmed Learning

(Prereq. 19.161 or 19.164) 4 Q.H.

The development of programmed instruction has been one of the products of basic behavioral research. Students learn to evaluate instructional programs in the light of basic behavioral principles, and become acquainted with programming techniques in the normal classroom, special education classroom, in complex academic subject matter, and in individual problem areas. **N**.

19.167 Applied Programmed Instruction

(Prereq. 19.166) 4 Q.H.

Students design, test, and evaluate instructional programs for teaching specific subject matter material, or for application to remedial problems, and to test basic instructional theory. **N**.

19.168 Behavior Changed in Institutions

(Prereq. 19.161 or 19.164) 4 Q.H.

A review of successful projects which have been carried out to provide effective remediation and rehabilitation in institutions for the mentally ill, the mentally retarded, the juvenile delinquent (prisons) and the developing human (schools). **N**.

19.169 Punishment and Anxiety

(Prereq. 19.161 or 19.164) 4 Q.H.

How do coercion and aversive consequences influence the course of individual behavior and social interaction? The experimental evidence is surveyed, including an examination of avoidance behavior, escape behavior, and the development of anxiety, as they occur under conditions of coercion. **N**.

19.170 Abnormalities of Language

(Prereq. 19.161 or 19.164) 4 Q.H.

The behavioral analysis of aphasia, stuttering, and reading problems. **N**.

19.171 Applied Behavior Modification I

(Prereq. 19.165, 19.166) 4 Q.H.

In field settings, students gain experience in applying the basic principles of behavior in situations where behavioral change is a desirable goal: remedying behavioral deficits and problem behavior in the retarded and mentally ill; the development of self-control by normal humans; the design of personalized instruction systems; the use of contingency contracting; and other problems of individual interest. **N**.

19.172 Applied Behavior Modification II

(Prereq. 19.171) 4 Q.H.

Continuation of 19.171. **N**.

SENSORY PSYCHOLOGY AND PERCEPTION

19.150 Perception

(Prereq. 19.106) 4 Q.H.

An introduction to the nature of the perceptual world; the nature of object recognition and identification, spatial organization, contextual effects, learning and perception, and the influence of attitudinal, motivational, and personality factors on perception. This course allows the student to self-pace his/her work, using a system of carefully structured work problems, supplemented by progress checks and tutorials.

19.153 Sensation

(Prereq. 19.150) 4 Q.H.

What and how we see, hear, feel, taste, and smell. Our perceptual world is studied in terms of loudness, brightness, color, flavors, etc., which can be specifically related to the functioning of our sensory nervous systems. **N.**

19.162 Sensation and Perception Laboratory I

(Prereq. 19.150) 4 Q.H.

Students do laboratory experiments on seeing, hearing, touching, and tasting. Studies may include dark adaptation, loudness, binaural interaction, brightness constancy, two-point touch thresholds, information processing and interactions between the senses.

19.173 Sensation and Perception Laboratory II

(Prereq. 19.162) 4 Q.H.

Students do laboratory experiments on visual and auditory perception. Studies may include: taste and smell, size and space perception, visual illusions, auditory localization, pattern recognition, pitch memory and left and right ear differences. **N.**

19.174 Vision Seminar

(Prereq. 19.162) 4 Q.H.

This seminar considers the current status of some of the classical problems of vision. Discussions are concerned with advanced problems of stimulus specification, retinal structure, photochemistry, and psychophysics. **N.**

19.175 Seminar on Auditory Perception

(Prereq. 19.162) 4 Q.H.

Dichotic listening, theories of pitch perception, critical bands, loudness functions, auditory pathology, single-unit measurements in the auditory nervous system, and other topics of interest serve as the basis for student-led discussions. **N.**

19.176 Seminar on the Tactual and Chemical Senses

(Prereq. 19.162) 4 Q.H.

Taste mixtures, olfactory adaptation, physiological basis of taste, tactual "speech", movement on the skin, subjective magnitude functions in taste and smell, and the stimulus for smell are the basis for seminar reports and discussions. **N.**

19.177 Seminar on Proprioception and Kinesthesia

(Prereq. 19.162) 4 Q.H.

Student-led discussions consider the sensory systems which serve the muscles, tendons, and joints, and the mechanisms by which they control integrated motor behavior. **N.**

19.190 Animal Psychophysics Laboratory

(Prereq. 19.162, 19.165) 4 Q.H.

A survey of behavioral techniques for investigating sensory and perceptual processes in lower animals. The use of animal subjects to study vision and hearing can provide new insights into the physiological and behavioral processes that underlie these important human functions. **N.**

19.191 Drugs and Perception Seminar

(Prereq. 19.150, 19.179) 4 Q.H.

Discussion centers on the changes in perceptual behavior which are produced by certain pharmacological agents and substances which act upon the sensory system. A critical examination is made of the experimental methods which are used to evaluate induced perceptual changes and the results which have been obtained. **N.**

19.192 Sensory and Perceptual Abnormalities

(Prereq. 19.150, 19.171) 4 Q.H.

A consideration of some of the peripheral factors which influence perception of the external world. Discussions consider how sensory deficits can influence behavior and some of the means for dealing with sensory and perceptual abnormalities. The application of programmed instruction to the development of sensory tests and remedial procedures for nonverbal people; blind or deaf retarded people, young children who have not yet learned to speak, and aphasic patients; the detection of hysterical sensory loss and malingering. **N.**

PHYSIOLOGICAL PSYCHOLOGY**19.178 Physiological Basis of Psychology I**

(Prereq. 19.106) 4 Q.H.

How nerves function and work together in the nervous system; how our sense organs provide the brain with information about the outside world; how the brain acts to produce externally observable behavior; and how such psychological concepts as perception, learning, motivation, arousal, and emotion may relate to nervous system activity.

19.179 Physiological Basis of Psychology II

(Prereq. 19.178) 4 Q.H.

Continuation of 19.178.

19.180 Seminar in Psychological Psychology

(Prereq. 19.179) 4 Q.H.

For students who desire an intensive discussion and practice of laboratory studies of physiological variables. Topics include: evolution of the nervous system, sensory and motor mechanisms, motivation and emotion, sleep, attention and perception, learning, and memory.

19.181 Practicum in Physiological Psychology

(Prereq. 19.180) 4 Q.H.

Laboratory experiments based on 19.180 discussion topics.

19.182 Arousal and Motivation Seminar

(Prereq. 19.179) 4 Q.H.

This seminar examines the experimental methods used to evaluate the concepts of arousal, activation, task relevancy, and motivation. Discussion deals with the results obtained in studies of sleep and wakefulness, attention, and vigilance, when using the electroencephalogram, electromyogram, galvanic skin reflex, reaction time, and the electrocardiogram as response indicators. **N**.

19.183 Biological Bases of Motivation

(Prereq. 19.179) 4 Q.H.

This course focuses on the mechanisms of eating and drinking behavior, attention, sleep, arousal, and emotional behavior. **N**.

19.184 Biological Bases of Learning and Memory

(Prereq. 19.179) 4 Q.H.

The capacity of organisms to learn and retain is analyzed as a function of the increasing complexity of brain structure and function at different phylogenetic levels. The course is concerned with the neural mechanisms underlying learning and the effects of brain damage on memory. **N**.

19.185 Physiological Basis of Abnormal Behavioral Development in Humans

(Prereq. 19.140, 19.179) 4 Q.H.

Interactions between human behavior and the central nervous system, with special emphasis on the role of abnormalities in illuminating normal processes of remembering and forgetting, speech, language, learning, and motor skills. **N**.

19.186 Comparative Psychology and Ethology

(Prereq. 19.179) 4 Q.H.

This course is concerned with the increasing complexity of behavior as we move from simple organisms to primates. Special attention is focused on experimental approach to instinctive, maternal, emotional, and problem-solving behavior. The constitutional vs. environmental factors in behavior are discussed in terms of phylogenetic development. **N**.

19.187 Sensory Physiology Seminar

(Prereq. 19.153, 19.179) 4 Q.H.

This seminar concentrates on the psychophysiology of various sensory systems. Discussions are concerned with the problem of accounting for sensory phenomena in terms of physiological concepts. Particular attention is given to the senses of vision and hearing. **N**.

19.188 Sensory Physiology Laboratory

(Prereq. 19.178, 19.150, biology elective) 4 Q.H.

Experiments are performed to illustrate the physiological techniques used in sensory psychology. Electrical recordings are made of some of the activities that accompany visual, auditory, and cutaneous activity. **N**.

19.189 Behavioral Pharmacology

(Prereq. 19.161, 19.179) 4 Q.H.

The application of quantitative behavior techniques in animals and man, to determine the behavioral effects of pharmacologic agents. A systematic survey of the experimental literature. **N**.

PERSONALITY, COGNITIVE, SOCIAL AND DEVELOPMENTAL ASPECTS**19.130 Social Psychology**

(Prereq. 19.106) 4 Q.H.

Among the topics included are a survey of current social theories and models in terms of their relevance to Black culture and experience, historical development of social psychology,

group membership and structure, leadership, and social movements.

19.135 Personality I (Prereq. 19.106) 4 Q.H.

A systematic study of the normal personality, its growth and development. Topics include: environmental and constitutional contributions, assessment of personality, research, and a survey of the major theories of personality.

19.136 Personality II (Prereq. 19.135) 4 Q.H.

Continuation of 19.135

19.138 Experimental Personality (Prereq. 19.161 or 19.164) 4 Q.H.

Introduction to methods and areas of research on personality. Includes problems of measurement, behavioral and dynamic concepts, and a laboratory project.

19.140 Normal and Abnormal Human Development (Prereq. 19.161, or 19.164) 4 Q.H.

The behavioral examination of developmental abnormalities—as evidenced in mental retardation, childhood schizophrenia, child delinquency, hyperactivity, specific learning problems, and aging—is used to illuminate normal developmental processes.

19.146 Motivation (Prereq. 19.106) 4 Q.H.

The various aspects of motivation, primary and secondary drives, unconscious motivation, effective motivation, the assessment of motives. This course is not designed for students majoring in Psychology, who cover this material in required advanced courses (see catalog section on Learning, Behavioral Analysis, and Behavior Modification).

19.155 Psychology of Language (Prereq. 19.106) 4 Q.H.

Topics include: the child's acquisition of language, verbal habits, the analysis and measurement of meaning, cultural determinants of linguistic behavior, communication processes, and recent research in psycholinguistics.

19.156 Psychology of Thought (Prereq. 19.155) 4 Q.H.

Psychological factors in problem solving, imagination, intuition, information processing, and concept learning.

19.157 Cognition and Human Learning (Prereq. 19.106) 4 Q.H.

A review of the verbal learning literature (studies dealing with paired-associate learning, serial learning, memory and attention) from a cognitive point of view. Higher-order mental processes, such as concept attainment, language development, probability learning. A consideration of mathematical models of human cognitive behavior.

19.202 Dynamic Psychology I (Prereq. 19.136, Middler Standing) 4 Q.H.

Discussions of the abnormal personality, historical background, criteria of abnormality, theoretical framework of normal and abnormal development, anxiety and defense, etiology, dynamics, and symptomatology of the neuroses.

19.203 Dynamic Psychology II (Prereq. 19.202) 4 Q.H.

Survey of psychotherapeutic techniques; etiology, dynamics and symptomatology of the psychoses; psychosomatic, sociopathic and organic disorders in the context of personality problems.

GENERAL ISSUES FOR PSYCHOLOGISTS

19.210 Scientific Foundations of Psychology (Prereq. Junior Psych. major) 4 Q.H.

The evaluation of modern psychology in the light of its historical origins. This course is designed especially for Psychology majors who are preparing for graduate school admissions and/or civil service examinations, both of which emphasize familiarity with historical issues, the work of major contributors to psychology, and the methods, data and theoretical systems they developed. Students often find this course most useful when taken at the end of the junior year or start of the senior year, shortly before the relevant examinations are scheduled.

19.278 Ethical Problems of Psychology (Prereq. Senior Psych. major) 4 Q.H.

A seminar examining some moral and ethical controversies associated with modern

psychologies theories and practices. What should be the goal of psychology? Is a commitment to scientific determinism consistent with humanistic goals? Is "mental illness" a myth? Are men controlled or basically free? Should psychologists attempt to control behavior and change attitudes? Is deception of experimental subjects justifiable? How can pseudoscientific psychological theories be distinguished from legitimate ones? Works to be discussed include those of Laing, Maslow, Sartre, Skinner, and Szasz.

19.279 Impact of Psychology on Society (Prereq. Senior Psych. major) 4 Q.H.

A seminar considering such recent developments as the uses of intelligence and aptitude tests, psychosurgery and electroconvulsive therapy, techniques of behavior modification and control, direct brain stimulation by implanted electrodes, use of psychoactive drugs, use of lie detectors, and the application of experimental techniques to humans.

19.280 Senior Seminar (Prereq. Senior Psych. major) 4 Q.H.

Small groups of students meet to discuss topics in psychology of mutual interest. Each seminar has a different flavor, depending on the student group and faculty member participant. At the start of each year, faculty members scheduled for this course describe a range of prospective topics for discussion each quarter (in the Psychology Department's course pamphlet, available from secretaries in 440 UR), to assist students in selecting the most appropriate seminar for their interests.

19.281 Social Change Seminar (Prereq. 19.168) 4 Q.H.

The relevance of behavioral principles to the design of social communities, the role of coercion (e.g., police, prisons, military) in the social system, a discussion of constructive alternatives to coercion, the relevance of law to individual behavior, the role of science in society, and the role of the university in society.

SPECIAL EXPERIENCES IN PSYCHOLOGY

19.285-289 Teaching Practicum in Psychology (Prereq. Dept. approval) (each) 4 Q.H.

Students who have received the grade of A in PSI courses may serve as undergraduate peer-teachers in subsequent quarters of the course, under the guidance of each course instructor. Includes a seminar on teaching technology and tutorial methods, how to handle individual study problems, analysis of case studies, etc. An undergraduate may repeat this course for P-F elective credit (counting toward Psychology major requirements) by teaching in several PSI courses. Application for participation in each course is made by communicating with the appropriate instructor at least one month before the start of each quarter.

19.290-294 Directed Study (Prereq. Dept. approval) (each) 4 Q.H.

Independent work under the direction of members of the Department, usually in a research project in one of the Department laboratories. Faculty members usually require completion of advanced laboratory courses in the area of research interest, but this is a matter of individual discussion. If you are interested in Directed Study, but are unsure of whom to approach for potential sponsorship, schedule a chat with your adviser.

19.295-298 Honors Program (each) 4 Q.H.

For prerequisites and other details, see the section on Honors in this catalog.

SERVICE COURSES (NOT ELECTIVES; NOT FOR PSYCH. MAJOR CREDIT)

19.101 Introductory Psychology 3 Q.H.

A discussion of psychological principles for students with career interests in health sciences and professions. (Assigned curriculum.)

19.102 Basic Psychology 4 Q.H.

A discussion of psychological principles for students with career interests in health sciences and professions. (Assigned curriculum.)

19.141 Growth and Development I 4 Q.H.

Emphasis on infancy and childhood. Fundamental processes of growth and development from conception to the beginning of adolescence; physical development and maturation;

socialization; social and interpersonal relations; intelligence, emotion, motivation and personality concepts. Emphasis upon family setting as well as upon broader social environment. (Assigned curriculum.)

19.142 Growth and Development II 4 Q.H.

Adolescence and adulthood. Exploration of physical and social changes in the years from adolescence to senescence. (Assigned curriculum.)

19.201 Psychology of Abnormal Behavior (Prereq. 19.140 or 19.141) 4 Q.H.

The symptomatology, etiology, dynamics, and therapy of the abnormal personality; the basic varieties of neurosis and psychosis; somatic therapies and fundamental varieties of psychotherapy. (Assigned curriculum.)

Anthropology

20.100 Principles of Social Anthropology 4 Q.H.

Basic principles.

Staff

All Quarters

20.130 Language and Culture 4 Q.H.

The function of language in human society and an introduction to the relationship between the patterns of language and the patterns of culture.

Prof. Bateson

Fall and Winter Qtrs.

20.135 Individual and Culture 4 Q.H.

An exploration of the ways in which the individual is shaped by his society and the ways in which he can effect change.

Staff

Spring and Summer Qtrs.

20.140 Evolution and Society 4 Q.H.

Human social and cultural evolution, and the theories which account for it.

Staff

Spring and Summer Qtrs.

20.160 Anthropology of the Family 4 Q.H.

Western scientific and popular conceptions and misconceptions about the nature of the family and family interaction in our own culture, in other cultures, and among animals. Advice on how to run a family will NOT be given!

Staff

Fall and Winter Qtrs.

20.170 Culture in Transition 4 Q.H.

Analysis of the changing patterns in social, economic, and political institutions. Modern social trends are discussed.

Staff

Winter and Spring Qtrs.

20.210 Tribal Societies and Cultures 4 Q.H.

The structures and institutions of bands, tribes, and chiefdoms; comparative and functional studies of tribal societies and the dynamics of change under contact situations.

Staff

Fall or Winter Qtrs.

20.214 Peasant Society and Culture 4 Q.H.

Institutions of peasant society. The structure of traditional civilizations and the interrelations between urban and local communities; comparative and functional analysis of the peasant community and the dynamics of change from peasant to post-peasant and industrialized societies.

Staff

Fall or Winter Qtrs.

20.220 Anthropology Methods 4 Q.H.*

Theory and practice of methods of field research and the analysis of data. Students take part in a field project.

Staff

Spring Qtr. alternate years.

*Including lab.

20.230 Language and Communication

4 Q.H.

Human communication, including language, theories of the evolution of language; language and kinesics, semiotics, social class, linguistic nationalism; linguistic problems in modernization.

Prof. Bateson

20.240 Human Origins

4 Q.H.

An intensive look at the data on fossil remains and the data on contemporary primates which are essential for an understanding of human physical and behavioral evolution. Efforts are made to bring the student into direct contact with primary materials.

Prof. Leibowitz

20.245 Cultural Ecology

4 Q.H.

An introduction to questions of human adaptation to environment and the effect of different adaptations on natural systems.

Staff

20.250 Political Anthropology

4 Q.H.

Origin and growth of the institutions of civilization. Specialization and social stratification in the dynamics of traditional civilizations; some special topics of contact and change.

Staff

20.255 Economic Anthropology

4 Q.H.

Types of economic systems in simple societies; reciprocal, redistributive, market exchange; economic relations as part of social relations; land tenure systems, credit systems, savings mechanisms. The transition from subsistence to cash economics.

Staff

20.257 Religion and Myth

4 Q.H.

Nature and institutionalization of primitive, ancient, and contemporary religions. Exploration of religious concepts and movements in relation to social, religious, and political organization.

Profs. Freilich and Bateson

20.259 Urban Anthropology

4 Q.H.

Selected problems in anthropological studies in urban societies.

Staff

20.260 Kinship and Society

4 Q.H.

This is a course for the advanced student only. A variety of kinship systems and their terminological and structural components, and the way in which their systems articulate with other social institutions.

20.270 Social Change and Economic Development

4 Q.H.

Selected studies of processes of transformation and modernization in nonindustrial societies.

Staff

20.280, 20.281, 20.282, 20.283, 20.284, 20.285, etc.

4 Q.H. (each)

Ethnographic area courses (New World Indian, Africa, India, Mediterranean, etc.) which will be offered as the Department's resources permit.

20.290-291 Directed Study

(Prereq. Department approval) 4 Q.H.

Independent work under the direction of members of the Department upon a chosen topic. Limited to qualified seniors preparing in anthropology with approval of the Department Chairman.

Staff

All Quarters

20.295, 296, 297, 298 Honors Program

All Quarters (each) 4 Q.H.

20.801-802 Theory

Qualified undergraduates may wish to take this course which is offered in the graduate school. Permission of the instructor is required for registration.

Sociology

21.100 Introduction to Sociology

4 Q.H.

Staff

All Quarters

21.107 Social Psychology

(Prereq. 21.100 or consent) 4 Q.H.

A social psychological approach to individual behavior in social contexts; introduction to basic concepts, such as socialization, identity, self-concept, role conflict, attitudes, and attitude measurement, groups and group processes, as well as an overview of major theoretical orientations and important substantive topics.

Prof. Golden and Levin

Fall and Winter Qtrs.

21.109 The Sociology of Everyday Life

(Prereq. 21.100 or equiv.) 4 Q.H.

The development, application, and consequences of rules for everyday activities (e.g., walking, talking, eating, drinking, sitting, smoking, laughing, crying, and sleeping); the effects of space, equipment, and territory on these activities on social life; and the expression of the emotions.

Prof. Rubington

Spring Qtr.

21.111 American Society

(Prereq. 21.100 or equiv.) 4 Q.H.

American society, culture, and major social institutions; economic, religious, governmental, familial, educational, welfare, and recreational; social classes and stratification, mobility, and individualism.

Prof. Lee and Rubin

Fall and Winter Qtrs.

21.112 Sociology of Poverty

(Prereq. 21.100 or consent) 4 Q.H.

An analysis of American poverty in historical perspective, drawing on comparisons with other countries. Critical evaluation of sociological research and theories relating to poverty. Consideration of causes and effects of poverty, as well as societal responses to poverty and its consequences. Suitable for students in applied fields, such as nursing, criminal justice, education, allied health, pre-med, and pre-law.

Prof. Holton and Krause

Spring and Summer Qtrs.

21.116 Environment and Society

(Prereq. 21.100 or equiv.) 4 Q.H.

Traditional perceptions of environment and man, contrasting Judaeo-Christian and other cultures such as Southwest American Indian and Japanese. Origins of contemporary conservation movement and concern with resource management in America. Public policy and public response to such environmental issues as population, air and water pollution, waste disposal, and land management. Environmental quality as ideology and the search for measureable indicators. Implication of international approaches to the understanding and control of ecosystems.

Prof. Rubin

Spring and Summer Qtrs.

21.118 Population and Society

(Prereq. 21.100 or equiv.) 4 Q.H.

Traditional and contemporary approaches to human population and its control. Factors affecting birth and death rates. Societal implications of population quantity and quality in several situations, past and present. Rural-urban migration and mobility; racial, genetic, stratificational components for population analysis. Public policies and public response to fertility control in several societies. International efforts to understand and to generate action on population issues.

Prof. Rubin and Holton

Fall and Winter Qtrs.

21.120 Sociology of the Family

(Prereq. 21.100 or equiv.) 4 Q.H.

The family as a social institution in several selected cultures; interrelations of the family and political, economic, and educational institutions; social nature of personality; role-taking; and the effects of individualism, mobility, and industrialism.

Prof. Holton and Lee

Fall and Spring Qtrs.

21.131 Crime, Conflict, and Justice

(Prereq. 21.100 or consent) 4 Q.H.

Analysis of social and political forces which create and perpetuate criminality in contem-

porary U.S. society; the impact of criminality upon law enforcement, judicial process, and the social order. Particular attention is devoted to violence as a means of resolving problems. In addition, this course examines the involvement of the legal system in processes of social conflict and change.

Prof. Garrett

Fall and Winter Qtrs.

21.135 Juvenile Delinquency

(Prereq. 21.100 or equiv.) 4 Q.H.

The sociological and psychological approaches and their implications for a typology of delinquency; problems of prevention, treatment, and rehabilitation.

Prof. Garrett

Spring and Summer Qtrs.

21.137 Social Deviance I

(Prereq. 21.100 or consent) 4 Q.H.

The conditions under which people categorize others as different; processes by which persons so defined are assigned deviant status and assume appropriate roles and self-images; development of deviant careers and their relationship to deviant subcultures; situations in which people transform deviant identity.

Profs. Rubington and Garrett

Fall Qtr.

21.138 Social Control I

(Prereq. 21.100 or consent) 4 Q.H.

Formation of social bonds and the conditions under which they are ruptured; the emergence of deviance as an interactional problem; the types of individual and societal reactions to the most prevalent forms of deviant behavior. Analysis of agencies of social control, their definitions of problems, and responses to typical clients.

Profs. Rubington and Garrett

Winter Qtr.

21.139 Social Problems

(Prereq. 21.100 or consent) 4 Q.H.

Analysis of five major sociological perspectives on social problems (pathology, disorganization, value-conflict, deviance, and labeling); the conditions under which certain recurrent events, activities, and persons become redefined as social problems (e.g., mine disasters, marihuana smoking, and alcoholism); study of the typical responses to social problems and their consequences.

Profs. Rubington, Holton, and Garrett

Spring Qtr

21.141 Drugs and Society

(Prereq. 21.100 or equiv.) 4 Q.H.

An introduction to the sociology of drugs. The course first examines social definitions of drugs, conditions of their use, and socialization into drug use. It then considers deviant drug use and effects of social control on definitions and use. A range of licit and illicit drugs will be considered but major emphasis will be given to alcohol, marihuana, and heroin.

Prof. Rubington

Spring Qtr

21.145 Urban Society

(Prereq. 21.100 or consent) 4 Q.H.

The foundations of city life in historical perspective; relationship of city life to environment, population, social organization, technology, and cultural values; growth trends, urbanization and urban planning.

Profs. Rubin and Holton

Fall and Winter Qtrs

21.150 Race and Ethnic Relations

(Prereq. 21.100 or equiv.) 4 Q.H.

Racial nationalities and religious groups, particularly with reference to the United States, special emphasis on historical development, specific problems of adjustment and assimilation, and specific present-day problems and trends.

Profs. Holton, Golden, and Lee

Fall and Winter Qtrs.

21.151 Sociology of Prejudice

(Prereq. 21.100 or consent) 4 Q.H.

Factors in the development and maintenance of prejudice and discrimination. Topics include: American race relations, anti-Semitism, sex roles, and stereotyping.

Profs. Levin, Golden, and Leibowitz

Fall and Winter Qtrs.

21.155 Medical Sociology

(Prereq. 21.100 or consent) 4 Q.H.

An examination of the professions, training, institutions, and problems in health care, with an emphasis on the United States. Practical issues in the improvement of health care systems are

considered.

Profs. Holton and Krause

Spring Qtr.

21.165 Industrialism and Industrial Man

(Prereq. 21.100 or consent) 4 Q.H.

The role of industry in modern society; similarities and dissimilarities among industrial societies, bureaucracy and its alternatives, unions, supervision democracy and manipulation, the man on the assembly line, sabotage of the organization, and the role of wages and alienation.

Prof. Rysman

Winter and Spring Qtrs.

21.175 Technology and Society

(Prereq. 21.101 or consent)

Does society control technology or is technology directing society? Has technology become dehumanized? How valid is the doctrine of technological inevitability? Can the technological "fix" be viewed as a "solution" to social problems? Is technology itself a social problem? What can be expected of "technology assessment"? What of the back-to-nature and anti-technology movements today: are they the waves of the future? These are some of the questions and issues which are discussed and analyzed. Students are expected to do considerable independent study and research.

Prof. Kaplan

Fall and Winter Qtrs.

21.176 Science and Society

(Prereq. 21.101 or consent)

The primary focus is on science rather than on technology. Exploration of the ways in which society affects, and is in turn affected by science. The emphasis is on science as a system of thought which includes a variety of methodologies and techniques, as an occupation and profession, and as one of several institutions which engage human beings and which affects the course of human history and development. Students are expected to do considerable independent study and research.

Prof. Kaplan

Spring Qtr.

21.200, 21.201 Group Behavior—The Sociological Imagination

(Prereq. consent of the instructor) 4 Q.H.

Limited to 15 students. An experimental course in which students act as a group in developing sociological imagination and perspective. Responsibility for learning in the group.

Prof. Geer

Fall, Winter, and Spring Qtrs.

21.207 Seminar in Social Psychology

(Prereq. 21.100 or consent) 4 Q.H.

Focus on the interaction of psychological and group processes. Students read original theoretical and research monographs in the field. Topics may include: prejudice, reference groups, sex roles, conformity, leadership, aggression, communication, collective behavior, and achievement.

Profs. Golden and Levin

Spring Qtr.

21.215 Collective Behavior

(Prereq. consent or five Soc.-Anthropology courses) 4 Q.H.

The rise of new group forms in response to persistent social unrest; study of masses, crowds, and publics; analysis of specific instances of collective behavior such as race riots, wildcat strikes, prison revolts, and campus disorders.

Prof. Rubington

Spring Qtr.

21.217 Mass Communication and Public Opinion

(Prereq. consent or four Soc.-Anthropology courses) 4 Q.H.

Topics include: factors in the formation and development of public opinion, the effect of television on children, mass communication as social organization, media-depicted images of society, the role of personal influence, the process of rumor, the use of the mass media by the poor, propaganda analysis, the latent and manifest functions of mass communication.

Prof. Levin

Spring Qtr.

21.231 Sociological Theories of Crime

(Prereq. consent or four Soc.-Anthropology courses) 4 Q.H.

Patterns and social forces involved in criminal behavior. Analysis of sociological theories of

criminality and comparison of these to other explanations of crime.

Prof. Garrett

Fall and Winter Qtrs.

21.236 Applied Sociology; Practice and Theory

(Prereq. consent or four Soc.-Anthropology courses) 4 Q.H.

An analysis of the conditions under which sociological knowledge is applied to social problems, the kinds of problems, and the degree of effectiveness of this application. Particular attention is paid to research and demonstration projects that derive from sociological theory.

Prof. Rubington

Fall Qtr.

21.237 Social Deviance II

(Prereq. 21.137 or consent) 4 Q.H.

An examination of the leading theories of deviance (anomie, subcultural deviance, labeling) and their principal variants; study of their assumptions, conceptions, proposition, and supportive evidence; analysis of empirical studies in each theoretical tradition.

Profs. Rubington and Garrett

Winter Qtr.

21.238 Social Control II

(Prereq. 21.138 or consent) 4 Q.H.

Study of the formation of new social policies in response to social problems; analysis of policy and problem, supporters and opponents of policy change, conditions under which control agencies adopt new policies, and effects of policy change. Particular emphasis on case studies of social action and legal change.

Prof. Rubington

Spring Qtr.

21.239 Intro. to Statistical Analysis

(Prereq. consent or four Soc.-Anthropology courses) 4 Q.H.*

Application to social data of the principles of measurement, probability, measures of centrality, tests of significance, and techniques of association and correlation.

Prof. Levin

Fall and Winter Qtrs.

21.240 Research Methods I (Prereq. consent or 4 Soc.-Anthropology courses) 4 Q.H.*

An introduction to social research, including survey techniques, design of research, interviewing, questionnaire construction, use of existing data, and content analysis. Students take part in a survey.

Prof. Golden

Fall and Winter Qtrs.

21.241 Research Methods II (Prereq. consent or four Soc.-Anthropology courses) 4 Q.H.

Analysis of social data by means of coding, tabulating, and statistically interpreting information from surveys and other sources.

Prof. Golden

Spring and Summer Qtrs.

21.245 Community Analysis (Prereq. consent or 4 Soc.-Anthropology courses) 4 Q.H.

Ecological, social structure, identity, and social action aspects of human settlements. Deals with change and conflict at the community level.

Profs. Rubin and Holton

Alternate Spring Qtrs.

21.246 Seminar in Urban Studies

(Prereq. 21.100 or consent) 4 Q.H.

Interdisciplinary approaches to urban studies are compared according to problem areas and research methods. Students have the opportunity to extend previous term paper projects after exposure to social action and social systemic theoretical perspectives.

Prof. Rubin

Spring Qtr.

21.250 Political Sociology; Who Gets What

(Prereq. consent or four Soc.-Anthropology courses)

An examination of formal political structures and informal quasi-political groups. Sociological analysis of ideology, class politics, mass movements, and the conflict of various social and economic groups as they vie for political power and influence.

Profs. Krause and Lee

Spring and Summer Qtrs.

*Including lab.

21.255 Sociology of Formal Organizations: Men, Machines, and Bureaucracy

(Prereq. consent or four Soc.-Anthropology courses) 4 Q.H.

A study of principles of formal organization. Theories of bureaucracy and concept of authority; communication systems and other conceptions of formal organization. Structure of work groups and their effect on the larger organization. The social content of organizations.

Profs. Krause and Rysman

Fall and Winter Qtrs.

21.260 Social Stratification: Class, Status, and Power

(Prereq. consent or four Soc.-Anthropology courses) 4 Q.H.

Theories of social inequality, concepts of social class, aspects of status and role difference, criteria for social mobility.

Profs. Krause, Holton, and Rysman

Fall and Winter Qtrs.

21.265 Sociology of Occupations and Professions

(Prereq. consent or four Soc.-Anthropology courses) 4 Q.H.

The meanings of work. Division of labor and specialization. Analysis of occupational structure and patterns of recruitment, training, and career preferences. The classic professions and new trends in professionalization.

Prof. Krause

Spring and Summer Qtrs.

21.270 Social Change

(Prereq. consent or four Soc.-Anthropology courses) 4 Q.H.

Social and cultural dynamics, with particular reference to the current contact situation occurring between industrialized and non-industrialized societies.

Prof. Lee

Spring Qtr.

21.280 Social Theory I

(Prereq. or four Soc.-Anthropology courses) 4 Q.H.

The development of sociology from the history of social thought. The emergence of several schools, beginning with Positivistic Organicism and Conflict Theory.

Staff

Fall and Winter Qtrs.

21.281 Social Theory II

(Prereq. consent or four Soc.-Anthropology courses) 4 Q.H.

A seminar-lecture course in which Formalism, Social Behaviorism, Social Action Theory, and Functionalism are studied critically.

Staff

Spring and Summer Qtrs.

21.287 Senior Seminar

4 Q.H.

Staff

Fall, Winter, and Spring Qtrs.

21.290, 21.291 Directed Study

(Prereq. Junior or Senior standing in Sociology or consent) (each) 4 Q.H.

Independent work on a chosen topic under the direction of members of the Department.

Limited to qualified students with approval of Department chairman.

All Quarters

21.291 Seminar in Current Emphases in Sociology

Review and discussion of selected sociological topics.

Staff

Spring Qtr.

21.295, 21.296, 21.297, 21.298 Honors Program

(each) 4 Q.H.

All Quarters

Political Science

21.101 Introduction to Political Science I

4 Q.H.

Basic political concepts and forces of organization from the classical Greeks to the modern nation-state. The Soviet Union and the United Kingdom are contrasted as contemporary illustrations of the institutional distinction between a totalitarian and a constitutional system.

Staff

22.102 Introduction to Political Science II

4 Q.H.

The development of operational liberty in the United States and its constitutional underpinnings are considered, together with an analysis of the national American political process and the conduct of recent American foreign relations.

Staff

Winter and Spring Qtrs.

22.131 American National Government

(Prereq. 22.102) 4 Q.H.

An analysis of the structure and functions of American government: the development of legislative policy and the nature of constitutional restraints on public power.

Prof. Worth

22.132 Political Behavior

(Prereq. 22.101) 4 Q.H.

An investigation of attitudes, perceptions and socialization as they relate to political preferences and actions, utilizing materials and concepts of the studies of culture, psychology, and society.

Profs. Jones and Schmitt

Spring and Summer Qtrs.

22.133 Political Parties and Pressure Groups

(Prereq. 22.102 or 22.131) 4 Q.H.

An analysis of political parties and pressure groups in the American political system, focusing on collective decision making, electoral strategy, and party responsibility.

Prof. Pfeiffer

22.134 The American Presidency

(Prereq. 22.102 or 22.131) 4 Q.H.

A multi-faceted examination of the nation's Chief Executive. The Presidential electoral process, the President's many constituencies, and the differing styles of various 20th-century Presidents. The constitutional and extra-constitutional powers of the office are some areas that are considered.

Prof. Cord

22.135 American Constitutional Law

(Prereq. 22.102 or 22.131 and Junior or Senior status) 4 Q.H.

Employing excerpts of U.S. Supreme Court decisions and other reading materials, this course attempts an analysis of some of the theoretical, structural, and substantive issues inherent in and relevant to the American constitutional system.

Prof. Cord

22.137 Civil Liberties

(Prereq. 22.102 or 22.131 and Junior or Senior status) 4 Q.H.

Employing U.S. Supreme Court decisions and other reading material, this course examines the substantive and procedural guarantees of the Bill of Rights and the Fourteenth Amendment and their relationship to a liberal democratic society.

Prof. Cord

22.139 American Ideology

4 Q.H.

The performance of American government measured against its ideal objectives as outlined in its ideologies.

Prof. Worth

Fall and Winter Qtrs.

22.141 State Government and Politics

(Prereq. 22.102 or 22.131) 4 Q.H.

The structure, functions and politics of the states, analyzing their role in the Federal system and their relationships with the national government, and their component local governments.

Prof. Berkley

22.143 Urban and Metropolitan Government

(Prereq. 22.141) 4 Q.H.

The political, structural and functional problems of an urbanizing United States, including analyses of urban, suburban, and metropolitan governmental systems and their roles in the Federal system.

Prof. Medeiros

22.145 Housing and Urban Renewal

(Prereq. 22.102, 22.143) 4 Q.H.

The technical, budgetary, intergovernmental and social problems of housing and urban

renewal.

22.146 Practical Politics (Prereq. 22.102) 4 Q.H.
Designed to accentuate and treat systematically some of the problems of organizing for effective citizen action, partisan and nonpartisan, at the grass roots level. An exploration of roles in political campaigning.
Prof. Grimes and Pfeiffer

Fall and Winter Qtrs.

22.151 Comparative Government (Prereq. 22.101) 4 Q.H.
European democratic and totalitarian forms of government. The United Kingdom, France, and West Germany.
Prof. Goldman

22.171 Law and Society 4 Q.H.

Introduction to the theory and philosophy of law; the historical foundations of the common law, legal methods. Primarily for non-Political Science majors.

Prof. Grimes

Summer Qtr.

22.173 Politics and Economic Problems (Prereq. 22.102 or 22.177) 4 Q.H.
A survey of the relationship between economic developments and political processes in the United States. Among the topics considered are: government planning of the economy, monopoly and government regulation, government programs to promote social welfare, and the impact of Federalism on the political-economic system.
Prof. Berkley

Winter and Spring Qtrs.

22.175 Current Political Issues 4 Q.H.
An analysis of the constitutional and political background of selected contemporary public issues. Primarily for non-Political Science majors.
Prof. Grimes

Fall and Winter Qtrs.

22.177 American Political Process 4 Q.H.
A general analysis of the American political system, including national, state, and metropolitan governments and their interaction. Not open to Political Science majors or anyone who has taken 22.102 or 22.131 (American National Government).
Prof. Grimes

22.178 The Politics of the Criminal Justice System (Prereq. 22.102 or 22.177) 4 Q.H.
The criminal justice system from arrest by police to appeal to the Supreme Court of the United States. The roles of police, lawyers, judges, prosecutors, juries, and correction officers will be examined.

Prof. Berkley

Spring and Summer Qtrs.

22.179 World Politics 4 Q.H.
An analysis of the behavior of nations in international society, with emphasis on major current developments. Not open to Political Science majors or anyone who has taken 22.221 (International Relations).

22.221 International Relations (Prereq. 22.102) 4 Q.H.
Elements and limitations of national power, contemporary world politics, problem of peace.
Prof. Jones

Fall and Winter Qtrs.

22.223 American Foreign Policy (Prereq. 22.102) 4 Q.H.
Formulation and conduct of foreign policy; role of the United States in politics since 1945.
Prof. Wilfong

22.224 United States—Far Eastern Relations (Prereq. 22.102) 4 Q.H.
Diplomacy of the United States concerning the Far East, with both Asian and non-Asian governments. Emphasis on the American role in the evolution of the Far Eastern power distribution from World War II to the present.
Prof. Jones

22.225 Soviet Government (Prereq. 22.151) 4 Q.H.
A study of Soviet political origins and behavior, with emphasis on recent changes in the party

and state apparatus, the economy, and the administration of justice.
Prof. Goldman

22.226 Soviet Foreign Policy (Prereq. 22.101 and Middler Status) 4 Q.H.
The evolution of Soviet foreign policy since 1917, with emphasis on the development of the international Communist movement and the onset of the East-West ideological conflict.
Prof. Goldman

22.227 Communism in Eastern Europe (Prereq. 22.101 and Middler Status) 4 Q.H.
The Communist governments of Eastern Europe, with emphasis on their growing independence from Soviet Russia. Recent political change, economic liberalization, and new orientation in foreign policy.
Prof. Goldman

22.228 Government and Politics in Africa (Prereq. 22.151 and Middler Status) 4 Q.H.
The governmental systems, political parties, socioeconomic problems, and foreign policies of selected states north and south of the Sahara.
Prof. Goldman

22.229 Government and Politics in North Africa (Prereq. 22.151) 4 Q.H.
A comparative analysis of the colonial experience, nationalism, and contemporary governmental and political organization and behavior in the Maghreb (Morocco, Algeria, Tunisia), Libya, Egypt, and the Sudan.
Prof. Goldman

22.230 Government and Politics in Sub-Saharan Africa (Prereq. 22.151) 4 Q.H.
A comparative analysis of the colonial experience, nationalism, and contemporary governmental and political organization and behavior in selected states south of the Sahara.
Prof. Goldman

22.231 International Organization (Prereq. 22.221) 4 Q.H.
Development of international organization, with special emphasis on the United Nations system.
Prof. Jones

22.233 International Law (Prereq. 22.221) 4 Q.H.
Territory and jurisdiction of states, treaties, recognition, peaceful settlement of disputes, resort to force.
Prof. Wilfong

22.240 Totalitarianism and Dictatorship (Prereq. 22.151) 4 Q.H.
An analysis of totalitarianism, dictatorship, and autocracy, including study of historical background, characteristics, theories of origin, nature, and significance, evaluation of techniques, ideologies (i.e., Marxism-Leninism), policies, and institutions. Particular attention is given to Soviet and German experience.
Prof. Bursey

22.242 The Politics of Revolution and Change (Prereq. 22.151) 4 Q.H.
An analysis of revolution and change, contemporary and historical, with attention to both theory and practice. Topics discussed include major trends in contemporary politics and society, and the relationship between political change and technological, scientific, or social change.
Prof. Bursey

22.243 Government and Politics of Communist China (Prereq. 22.221) 4 Q.H.
Government and party organization, socio-economic problems and policies, and foreign relations of Communist China. Attention is given to the influence of history and ideology as determinants of attitudes and behavior.
Prof. Goldman

Winter Qtr.

22.245 The Politics and Policies of Developing Nations (Prereq. 22.221) 4 Q.H.
A survey of recent political and related change among third-world countries of Africa, Latin

America, and Asia. Topics included are: the heritage of colonialism and achievement of independence, the realities of cultural pluralism, revolution and political violence, institution building, political leadership and role of ideology, political parties, military in politics, and international aspects of political modernization.

Prof. Schmitt

22.247 Government and Politics of Latin America (Prereq. 22.221) 4 Q.H.

The governmental systems, political parties, socioeconomic problems, and foreign policies of Latin American states.

Prof. Schmitt

22.261 Public Administration (Prereq. 22.102 or 22.131) 4 Q.H.

Introduction to the theory and practice of public administration, with special emphasis on the generalities of institutions, processes, and behavior of bureaucratic organizations.

Profs. Berkley and Medeiros

22.270 Political Theory (Prereq. Junior Status or consent of instructor) 4 Q.H.

An analytic approach to the study of key political concepts: e.g., power, stability, equality, freedom, authority, obligation.

Prof. Barkley

22.272 Selected Issues in Political Theory (Prereq. 22.271) 4 Q.H.

Intensive examination of some dominant issues in modern political theory.

Prof. Bursey

22.273 Political Thought I (Prereq. Junior Status or consent of instructor) 4 Q.H.

An analytical and historical examination of the great political thinkers and of the main ideas in political thought from the Renaissance.

Prof. Bursey

22.274 Political Thought II (Prereq. 22.273) 4 Q.H.

An analytical and historical examination of the great political thinkers and of the main ideas in political thought from the Renaissance to the 20th century.

Prof. Bursey

22.276 American Political Thought (Prereq. 23.211) 4 Q.H.

The contributions to political theory of the main social, economic, political, intellectual, and philosophic movements in America from the colonial period to the present.

Prof. Barkley

22.278 Contemporary Political Thought (Prereq. 22.101) 4 Q.H.

Analysis of current ideals, ideologies, and political movements, including Existentialism, Neo-Marxism, Black Power, Women's Liberation. The decline of ideology and behavioralism.

22.280 Research Methods in Political Science 4 Q.H.

An introduction to some of the most common methods of carrying out research in the discipline of political science. Problems of theory construction, data-gathering, and a selection of analytical research tools including bibliographical aids and the computer.

Prof. Pfeiffer

2.282 Seminar in American Government

(Prereq. Senior Political Science major and consent of instructor) 4 Q.H.
A study in depth of selected topics in American government.

Prof. Worth

2.283 Seminar in International Relations

(Prereq. Senior Political Science major and consent of the instructor) 4 Q.H.
A study in depth of selected topics in international relations.

Prof. Wilfong

2.284 Seminar in Comparative Politics

(Prereq. Senior Political Science major and consent of the instructor.) 4 Q.H.

A study in depth of selected topics in comparative politics.

Prof. Goldman

22.285 Senior Seminar in Political Science

(Prereq. Senior Political Science major) 4 Q.H.

A study in depth of selected topics in political science.

Prof. Barkley

22.287 The Politics of Poverty

4 Q.H.

An intensive examination of political, social, economic and legal approaches to poverty and the poor in America. The course will focus on four principal strategies for dealing with poverty: 1. rights for the poor, 2. equality of opportunity, 3. redistribution of income, and 4. rejection of material values.

22.290, 22.291, 22.292, 22.293 Directed Study

4 Q.H.

Independent work under the direction of members of the Department on a chosen topic. Limited to qualified Seniors majoring in Political Science, with approval of Department Staff

22.295, 22.296, 22.297, 22.298 Honors Program

(each) 4 Q.H.

Staff

History

23.101 Western Civilization

4 Q.H.

The major ideas and institutions of Western Civilization from ancient times to 1648.

Prof. Fullington and Staff

23.102 Western Civilization

4 Q.H.

A continuation of 23.101, covering the period since 1648.

Prof. Fullington and Staff

23.109 Population in European History (Group A or B)

4 Q.H.

An application of the principles of demography to European history from Roman times to the present, with attention to the interaction of birth, death, marriage, and migration rates with climate change, epidemic disease, war, economic developments, social upheaval, and political policy.

Prof. Post

23.111 Ancient Greece (Group A)

4 Q.H.

The origins and development of Greek civilization; political evolution of Hellenistic society from tribal to city-state organization; growth and application of Greek religious, political, and ethical ideas.

Prof. Fullington

23.112 Ancient Rome (Group A)

4 Q.H.

Roman civilization in two sequences: 1. the rise of Roman power under the Republic, and 2. the decline of Roman power under the Empire.

Prof. Fullington

23.115 Medieval Europe (Group A)

4 Q.H.

Europe from the Barbarian Invasions to the late 13th century; the expansion of Christianity and the institutionalization of church and papacy; the emergence of the Holy Roman Empire, England, and France as political units; social, cultural, and economic developments.

Prof. Francois

23.116 Europe in the Age of the Renaissance (Group A)

4 Q.H.

Europe from 1300 to 1500, when alternatives to medieval institutions became increasingly apparent. Special attention to political, economic, and cultural changes in Italy and Northern

Europe.

Profs. Francois and Blaisdell

23.119 Europe in the Age of the Reformation (Group A) 4 Q.H.
Political, economic, social, and religious background of the Protestant and Catholic Reformations from 1500 to 1660. Emphasis also on the impact of the Reformation on Europe.
Profs. Francois and Blaisdell

23.120 Europe in the Age of Reason (Group B) 4 Q.H.
A survey of European history from 1660 to 1815, a time of great ferment climaxed by the French Revolution and Napoleon.
Prof. Francois

23.121 Nineteenth Century Europe (Group B) 4 Q.H.
Europe during a century of dramatic transformation: the Industrial Revolution, the post-Napoleonic reaction; liberalism, socialism, nationalism, and imperialism.
Profs. Allen and Anderson

23.122 Europe, 1870—1921 (Group B) 4 Q.H.
Europe from the Franco-Prussian War to the post-World War I settlement: the growing tensions and rivalries, and declining certainties of the end of the 19th century, the origins of World War I, the War itself, the Russian Revolution, and the Peace of Paris. (Not open to students who intend to receive credit for 23.125.)
Profs. Herman and Stembridge

23.123 Europe since 1921 (Group B) 4 Q.H.
Europe from the Versailles Settlement: the rise of totalitarianism, the Depression, the crises of liberalism and of the European mind, the Appeasement Era, World War II, the Cold War, the end of colonialism, and Europe today. (Not open to students who have received credit for 23.125.)
Profs. Allen, Herman, and Stembridge

23.124 Early Modern France (Group A) 4 Q.H.
Intensive study of the political, economic, social, and intellectual development of France from the end of the Hundred Years' War through the reign of Louis XIV.
Prof. Blaisdell

23.127 Eighteenth Century France (Group B) 4 Q.H.
The history of France in the age of the *ancien regime* and the Enlightenment as background for the French Revolution and Napoleon.
Prof. Blaisdell

23.128 Modern France (Group B) 4 Q.H.
A survey of the chief political, social, economic, intellectual, and cultural developments of France from the Revolution to the present.
Prof. Allen

23.129 Modern Germany (Group B) 4 Q.H.
A survey of German political, economic, social and cultural history since 1815.
Prof. Allen

23.130 England to 1688 (Group A) 4 Q.H.
Prehistoric Britain, the Anglo-Saxons, the Normans, the Plantagenets, the Tudors, and the Stuarts, with emphasis on the development of parliamentary institutions until the Glorious Revolution.
Profs. Francois and Blaisdell

23.131 England since 1688 (Group B) 4 Q.H.
England from the Glorious Revolution to the present, with emphasis on the development of Parliament, the Industrial Revolution, 19th-century reaction and reform, the World Wars, and

the rise of socialism.

Profs. Backstrom and Stembridge and Dean Ketchum

23.133 Stuart England (Group A)

4 Q.H.

England from 1603 to 1688, with emphasis on social and economic change and the origins of modern liberalism.

Prof. Backstrom

23.135 Victorian England (Group B)

4 Q.H.

The economic, social, and political life of the English people during Victoria's reign.

Prof. Backstrom

23.137 England since 1900 (Group B)

4 Q.H.

The economic, social, and political life of the English people in the 20th century.

Prof. Backstrom

23.140 Imperial Russia (Group B)

4 Q.H.

The emergence of Russia as a recognized European power, westernization and expansion in the 18th century, the impact of Napoleon, reform and revolution.

Prof. Fullington

23.141 Soviet Russia (Group B)

4 Q.H.

Forces molding the history of Russia since 1917, internal developments, foreign relations.

Prof. Fullington

23.143 Ancient Middle East (Group D)

4 Q.H.

From the origins of civilization in Egypt and Mesopotamia to the break-up of the ancient world in the fourth century, with emphasis on religion and culture.

Mrs. Frothingham

23.144 The Middle East, 315-1800 (Group D)

4 Q.H.

Contacts and conflicts between East and West, emphasizing the rise and flowering of Islam.

Mrs. Frothingham

23.145 The Modern Middle East (Group D)

4 Q.H.

The Middle East since 1800, with emphasis on the background to present problems.

Mrs. Frothingham

23.147 Africa before 1850 (Group D)

4 Q.H.

African prehistory, the formation of premodern societies, the dynamics of Afro-European contact before 1850.

Prof. Anderson

23.150 The Commonwealth Countries (Group D)

4 Q.H.

The evolution of the British Empire into the Commonwealth of Nations and the development of the principal Commonwealth countries (excluding Africa). Special emphasis on the history of Canada, Australia, New Zealand, and India.

Prof. Stembridge

23.151 Modern Africa (Group D)

4 Q.H.

The European impact on Africa, the rise of African nationalism, the emergence of independent African states, and the background of their present problems.

Prof. Anderson

23.152 Africa: National Histories (Group D)

4 Q.H.

Special studies of the histories of selected African nations.

Prof. Anderson

23.153 West African History (Group D)

4 Q.H.

The political, economic, social, and cultural history of the people of West Africa.

23.169 Far Eastern Civilization to 1850 (Group D)

4 Q.H.

Premodern histories and cultures of China, Japan, and Korea from antiquity to 1850.

Prof. Anderson

- 23.170 Modern Far East (Group D)** 4 Q.H.
The Far East since 1850, with emphasis on China and Japan and their relations with other nations.
Prof. Ring
- 23.181 European Economic History to 1750 (Group A)** 4 Q.H.
The major economic developments of Europe, including studies in agriculture, commerce, and industry.
Prof. Francois
- 23.182 Modern European Economic History (Group B)** 4 Q.H.
Survey of the development of the Western world examined within the framework of economic theory, with attention to social and political ramifications.
Prof. Post
- 23.199 The Historian's Craft** 4 Q.H.
The ways in which the historian studies the past and the nature of historical statements. Problems considered include research techniques, changing conceptions of historical knowledge, and the relationship between the historian and the society in which he works.
Prof. Post
- 23.201 Colonial America (Group C)** 4 Q.H.
The discovery and exploration of the New World, the settlement of the English colonies on the North American mainland, their development to 1763, and the origin of their clash with England.
Prof. Fowler
- 23.202 The American Revolution (Group C)** 4 Q.H.
The coming of the American Revolution, its nature and progress, and its political, economic, and social aftermath.
Prof. Fowler
- 23.210 The United States to 1877** 4 Q.H.
The history of the American people from 1763 to 1865, with an analysis of the American Revolution and of the major political, constitutional, diplomatic, economic, and social problems of the new nation.
Prof. Robinson and Staff
- 23.211 The United States since 1877** 4 Q.H.
A continuation of the survey of American history, with discussion of the emergence of an industrial economy, an urban society, world responsibility, and expanded Federal government.
Prof. Robinson and Staff
- 23.213 American Urban History (Group C)** 4 Q.H.
The development of urban society in the United States in the 19th and 20th centuries, with emphasis on the effects of immigration and industrialization upon the politics, thought, and society of American cities.
- 23.215 The United States, 1781—1825 (Group C)** 4 Q.H.
The political, economic, and psychological problems of adjustment to peace at the conclusion of the American Revolution; the development of an independent nation to 1825.
- 23.216 American Reformers and Reform Movements (Group C)** 4 Q.H.
An analysis of American reform, especially in the 19th century.
Prof. Jacobs
- 23.217 American Society and Politics in the 19th Century (Group C)** 4 Q.H.
An interdisciplinary examination of social structure and political behavior in late 19th-century America.
Prof. Campbell

4 Q.H.

23.218 The Civil War and Reconstruction (Group C)

The coming of the Civil War, its nature and progress, and the aftermath of Reconstruction.
Prof. Jacobs

4 Q.H.

23.220 The United States, 1890—1920 (Group C)

Populism, progressivism, World War I, and the reaction of the 1920s.
Prof. Bishop

4 Q.H.

23.221 The United States, 1920—1945 (Group C)

The Depression, the New Deal, World War II, and mid-century, emphasizing the clash between liberalism and conservatism and the movement from isolationism to interventionism.
Prof. Bishop

4 Q.H.

23.222 The United States since 1945 (Group C)

America's diverse responses to the postwar challenges of urbanization, economic change, civil rights, and Communism.

4 Q.H.

23.228 American Political Parties (Group C)

An examination of the emergence and development of parties from the Constitution to mid-20th century, with attention to their support, programs, and function.
Prof. Campbell

4 Q.H.

23.229 American Social Structure (Group C)

A topical survey of the American social structure, focusing on population processes, family structure, ethnicity, social classes, and mobility.
Prof. Campbell

4 Q.H.

23.241 Afro-American History (Group C)

The history of blacks in the English colonies and in the United States since the 17th century. The history of relations between white and black Americans. The evolution of institutions and attitudes of black Americans.
Prof. Jacobs

4 Q.H.

23.250 American Historians (Group C)

The literature of American history; major American writers of American history from the colonial period to the present, with emphasis on changing form and substance.
Prof. Robinson

4 Q.H.

23.251 American Biography (Group C)

The history of American biography since 1789 and biographies of representative Americans.
Prof. Robinson

4 Q.H.

23.276 Latin America to 1850 (Group D)

The fusing of the cultures of the Indian, the Iberian, and the Negro; the European and American forces which gave rise to the Latin American wars for independence; the early development of the new nations.
Prof. Bishop

4 Q.H.

23.277 Modern Latin America (Group D)

Latin America from the mid-19th century to the present; dictatorial republics and the continuation of poverty and injustice; the struggles toward democracy, the rise of nationalism, and the threat of Communism; the relations between the United States and Latin America.
Prof. Bishop

4 Q.H.

23.288 Seminar in Medieval History (Group A)

Prof. Francois

4 Q.H.

23.289 Seminar in European Intellectual History (Group B)

Not open to students who received credit for 23.126.
Prof. Herman

23.290 Seminar in Modern European History (Group B) Prof. Francois	4 Q.H.
23.291 Seminar in American History (Group C) Prof. Campbell	4 Q.H.
23.292 Seminar in Early Modern Europe (Group A) Prof. Francois	4 Q.H.
23.293 Seminar in the History of Socialist Thought (Group B) Prof. Backstrom	4 Q.H.
23.294 Seminar in French History (Group A or B) Profs. Allen and Blaisdell	4 Q.H.
23.295, 23.296, 23.297 Honors Program Staff	(each) 4 Q.H. Fall, Winter, and Spring Qtrs.
23.299 Directed Study Staff	4 Q.H. All Quarters

Afro-American Studies

25.050 Educational Issues for Black Americans (Prereq. 25.251 or consent of instructor)	4 Q.H.
Issues in alternative schools, curricula, funding, and outcomes that concern black people. These issues are researched and critically analyzed as to what effect they will have on black America. The course takes the format of a seminar, with well-known guest speaker presentations integrated with usual class presentations.	
25.051 Community School Approaches	4 Q.H.
25.100 Science and Black Society I A firm foundation in science and scientific method is the groundwork for an interesting look at the implications of scientific investigations on black society. Has science really enriched the black society or has it hindered it? What are the far-reaching effects of the Tuskegee Project, the Eugenetics of Jensen and Shockley, legalized abortion and the population explosion, National Institute of Health (NIH)-granted policies, the shortage of black physicians? What has been the role of blacks in science? In short, we examine a myriad of questions in order to elucidate the interrelationships between science and the black society.	4 Q.H.
25.101 Science and Black Society II (Prereq. 25.100 or consent of instructor)	4 Q.H.
25.109 Contemporary Black Issues in Statistics	4 Q.H.
25.140 Language Arts (Prereq. 30.113 and consent of instructor)	4 Q.H.
Designed to sharpen the student's language skills, emphasizing the achievement of linguistic analysis and precision in English despite its second-language status for many blacks, and its several inherently anti-black uses and connotations.	
25.141 Elementary Swahili Essentials of grammar; practice in pronunciation and progressive acquisition of a basic vocabulary; idiomatic expressions.	4 Q.H.
25.143 Intermediate Swahili Review of grammar, with practice in composition and conversation.	(Prereq. 25.142) 4 Q.H.
25.145 Elementary Arabic Essentials of grammar; practice in pronunciation and progressive acquisition of a basic vocabulary; idiomatic expressions.	4 Q.H.
25.147 Intermediate Arabic Review of grammar, with practice in composition and conversation.	(Prereq. 25.145 or consent of instructor) 4 Q.H.

	114
25.149 Introduction to African Languages	4 Q.H.
25.150 Blacks and the Media	4 Q.H.
25.170 Economic Problems of Black Americans	4 Q.H.
The correlation among social, political, and economic conditions of black people in the United States.	
25.171 Poverty and Health Care	4 Q.H.
25.172 Community Medicine and Delivery of Health Care	4 Q.H.
25.180 Black Diseases	4 Q.H.
25.181 Black Nutritional Habits	4 Q.H.
25.210 Contemporary Problems in Black Society	4 Q.H.
Study of contemporary psycho-political problems. From a study of this area in its global generality should come a careful paper on problem-solving in a specific area.	
25.217 The Black Family	4 Q.H.
25.218 The Black Man/Black Woman	4 Q.H.
25.219 Researching Black Issues	4 Q.H.
25.221 Black Ideogies	4 Q.H.
An introduction to psychological politics which deals with the traditional approaches to political science, "The Political You", and the interdisciplinary nature of the social sciences.	
25.222 Third World Political Relations	4 Q.H.
An introduction to theory and practice of relations among nations. Special attention is given to relations between the "have" and "have-not" nations. Emphasis on Third World problems.	
25.250, 251 Foundations of Black Culture I, II,	4 Q.H.
An overview of the rich and varied aspects of life for all people of African descent. 25.250 studies black culture from ancient African cultures through the Civil War, and 25.251 from Reconstruction to the 70's. This introductory course in Afro-American Studies is team-taught by staff in history, literature, music, drama, education, human services, philosophy, and social sciences.	
25.252 Organizing Black Communities	4 Q.H.
A seminar designed for those students whose concerns and future professional involvements might be in the urban community.	
25.253 Seminar: Wright/Ellison	(Prereq. Freshman English and consent of instructor) 4 Q.H.
Detailed study of the works of Richard Wright and Ralph Ellison. Designed for junior and senior students with an interest in literary style and content of these two exemplary black writers.	
25.254 Black Community and Social Change	(Prereq. 25.251 or consent of instructor) 4 Q.H.
Study of those components of the black community which exercise (active or passive) social control: the black church family, ethos. What environmental factors make us what we are? What environmental controls make for change? For what kind of change?	
Offered 1974-75	
25.257 Field Seminar	(Prereq. consent of instructor) 4 Q.H.
A practical program of carefully supervised field work, designed to provide a special opportunity for career preparation. First-hand knowledge of the realities of working in a given situation are expected to begin development. This course is closely supervised by the appropriate staff member in a given area, and is intended to supplement classes and co-op in a particular area of career preparation.	

Offered 1974-75

25.258 Directed Study (Prereq. consent of instructor) 4 Q.H.
A scholarly piece of independent research under the supervision of an instructor or professor of Afro-American Studies (or, by mutual consent, another Department). The student is expected to choose an academic problem of particular interest to him, in light of his career preparation, and to develop the tools to show how it might be solved.

Offered 1975-76

25.259 Directed Study Toward Senior Thesis (Prereq. consent of instructor) 4 Q.H.
All majors are required to do a substantive senior thesis. Advisors in the student's area work closely with each candidate to show how his scholarly and career preparation best merges into a final project; where applicable, a field work component is encouraged.

Offered 1975-76

25.260 Black Ethics (Prereq. consent of instructor) 4 Q.H.
Philosophical treatment of changes in traditional Western ethics produced by such notions as "Black Power", "The New Morality", "The New Left". Should be especially useful for students in Philosophy, Criminal Justice, and Afro-American Studies programs.

25.270 Black Aesthete in Design 4 Q.H.

25.271 History of Afro-American Art 4 Q.H.

25.280 African Rhythms and Harmonies 4 Q.H.

25.281 Black Music 4 Q.H.
General survey of Afro-American music in the U.S., traced from its origins in Africa to the present. Intended to introduce the student to the vast and rich expanses of black musical culture from a musical and socio-historical standpoint.

25.920 Afro-Americans and the Law 4 Q.H.

The following courses may also be of interest to the student wishing to concentrate in Afro-American Studies. Descriptions for these courses may be found in the appropriate departmental listing.

21.145	Urban Society
21.150	Race and Cultural Relations
21.270	Social Change
20.250	Political Anthropology
20.255	Economic Anthropology
20.259	Urban Anthropology
22.132	Political Behavior
22.133	Political Parties and Pressure Groups
22.137	Civil Liberties
22.171	Law and Society
22.228	Government and Politics in Africa
22.229	Government and Politics in North Africa
22.233	International Law
22.242	The Politics of Revolution and Change
22.245	The Politics and Policies of Developing Nations
22.270	Political Theory
22.278	Contemporary Political Thought
23.241	*Afro-American History I
23.242	*Afro-American History II
23.153	West African History
26.101	Introduction to Philosophy I
26.102	Introduction to Philosophy II
26.155	Moral Philosophy
26.120	Existentialism

26.131
30.267
30.268
30.269
30.276

Social Philosophy
* Afro-American Literature I
* Afro-American Literature II
The Black Novel
African Literature

**Required for majors*

Philosophy

26.101 Introduction to Philosophy I

26.102 Introduction to Philosophy II

(each) 4 Q.H.

An examination of some of the central and persistent issues in philosophy. These courses are independent and may be taken in reverse order. Both emphasize philosophical thinking as an activity rather than the assimilation of an established body of facts. 26.101 includes such topics as theories of reality, theories of knowledge, and philosophical problems in religion. 26.102 includes such topics as social and political philosophy and philosophies of art and history.

Staff

26.101-Fall and Winter Qtrs.

26.102-Spring and Summer Qtrs.

26.110 History of Ancient Philosophy

4 Q.H.

From early Greek philosophy before the time of Socrates to the Christian Period. Emphasis upon the thought and influence of Socrates, Plato, and Aristotle; secondary attention given to the Epicureans, the Stoics, and the Neo-Platonists.

Prof. Fogg

Fall and Winter Qtrs.

26.111 History of Modern Philosophy

(Prereq. 26.110 or consent of instructor) 4 Q.H.

European philosophy from the Renaissance to the 19th century; emphasis upon Francis Bacon, Descartes, Spinoza, Locke, Berkeley, Hume, and Kant.

Prof. Fogg

Spring and Summer Qtrs.

26.117 Nineteenth-Century Philosophy

(Prereq. 26.110 and 26.11 or consent of instructor) 4 Q.H.

Selected trends in this century, such as the development of German idealism, romanticism, evolutionism, materialism, and positivism. Hegel, Schopenhauer, Nietzsche, Kierkegaard and Marx are representative.

To be announced

Not offered 1973-74

26.118 Twentieth-Century Philosophy

(Prereq. 26.110 and 26.11 or consent of instructor) 4 Q.H.

Contemporary philosophic movements in metaphysics and methodology exemplified by process philosophy, linguistic analysis, pragmatism, phenomenology, and existentialism.

To be announced

Not offered 1973-74

26.119 American Philosophy

(Prereq. 4 Q.H. of philosophy or consent of instructor) 4 Q.H.

Background to American philosophy: Locke, Newton, Jonathan Edwards, and Cadwallader Colden. The American Enlightenment: Jefferson, Paine, and Benjamin Rusn. Pragmatism Peirce, James, Dewey, and Meade. Realism: Perry and Sellars. All of the above are dealt with in this course.

Prof. Hacker

Not offered 1973-74

26.120 Existentialism

(Prereq. 4 Q.H. of philosophy or consent of instructor) 4 Q.H.

The influence of Kierkegaard and Nietzsche upon 20th-century existentialism; its critique of scientific and traditional philosophy; the influence of existentialism upon literature and theology; emphasis upon Jaspers, Heidegger, Marcel, Sartre, and Camus.

Prof. Kovaly

Fall and Winter Qtrs

26.121 Analytic Philosophy (Prereq. 8 Q.H. of philosophy or consent of instructor) 4 Q.H.
The development of the analytic movement from its beginnings in the early works of Moore and Russell. Some treatment of Russell's logical atomism, the logical positivists, the thought of Ludwig Wittgenstein, and their widespread influence.
Prof. DeAngelis

Not offered 1973-74

26.130 Aesthetics 4 Q.H.
An analysis of the nature and meaning of aesthetic experience and the principles of art criticism. The possibility of standards in art and the relation of art to ethics, society, and religion are discussed.
Prof. Hacker

Fall and Winter Qtrs.

26.131 Social Philosophy (Prereq. 4 Q.H. of philosophy or consent of instructor) 4 Q.H.
A study of the major forms of political and social organization, with particular emphasis on the analysis and explanation of social change. Some attention given to the more general topic of the nature of explanation in the social sciences.
Prof. Kovaly

Spring and Summer Qtrs.

26.133 Philosophy of Science
(Prereq. 4 Q.H. of philosophy *unless required in your major*) 4 Q.H.
An examination of key concepts in the methodology of science: scientific explanation, prediction, confirmation, laws, and theories.
Prof. Hacker

Not offered 1973-74

26.134 Philosophy of Religion 4 Q.H.
Examines and evaluates such problems as arguments for and against the existence of God, derived from reason and experience; analytical and psychological approaches toward religious belief; concept of immortality; nature of revelation and faith; the relation between science and religion.
Prof. Wellbank

Fall and Winter Qtrs.

26.135 Philosophy of Man (Prereq. 4 Q.H. of philosophy or consent of instructor) 4 Q.H.
An historic, philosophical inquiry into different theories of man, dimensions and characteristics of man, with a special interest in conceptions of the alienation of man. Selected readings include: Descartes, Hobbes, Hegel, Marx, Kierkegaard, Maritain, Fromm, Marcuse, and Frankel.
Prof. Kovaly

Not offered 1973-74

26.137 Philosophy and Literature 4 Q.H.
Analysis of basic philosophic themes expressed in such writers as: Tolstoy, Dostoevski, Thomas Mann, Sartre, Camus, Kafka, Hesse, Bellow, and others.
Prof. Kovaly

Not offered 1973-74

26.150 Introduction to Logic 4 Q.H.
Recognition of common fallacies, practical exercises in effective argument, formal principles of correct and incorrect reasoning; entails traditional, deductive logic. Included are formal and informal fallacies.
Prof. Hacker and Staff

All Quarters

26.151 Symbolic Logic
(Prereq. 4 Q.H. of philosophy or consent of instructor) 4 Q.H.
The application of formal symbolic techniques to logic: elementary first-order deductive logic is covered; some consideration of the theory of identity, and the metatheory of first-order logic may be included.
To be announced

Fall and Winter Qtrs.

26.152 Epistemology (Prereq. 4 Q.H. of philosophy or consent of instructor) 4 Q.H.
Major theories, problems and concepts in the theory of knowledge: problems of scepticism and the justification of beliefs; the nature of knowledge and truth; relation of reason and experience to knowledge.
Prof. Nathanson

Spring Qtr.

26.153 Metaphysics (Prereq. 4 Q.H. of philosophy or consent of instructor) 4Q.H.
The central questions of metaphysics, as well as a survey of the metaphysical positions of major importance.
To be announced Spring Qtr.

26.155 Moral Philosophy 4 Q.H.
A critical appraisal of value and obligation, human rights, economic and criminal justice, and such issues as ethical relativity and empiricism, from the standpoint of rule-utilitarianism.
Prof. Wellbank Spring Qtr.

26.156 Modern Ethical Theories (Prereq. 26.155 or consent of instructor) 4 Q.H.
The aim is to study intensively some recent major developments in moral philosophy. The topics selected are: the cognitivist-noncognitivist controversy in meta-ethics, the concept of social justice in normative ethics, human rights, punishment, and the adequacy of rule utilitarianism as a normative ethical theory.
Prof. Wellbank Not offered 1973-74

26.174 Christian Faith and the Problem of Interpretation 4 Q.H.
An examination of 20th century attempts at understanding the meaning of Christian faith. Beginning with some of the classical approaches to New Testament interpretation, the study concentrates on issues raised by Albert Schweitzer's "Quest of the Historical Jesus," Rudolph Bultmann's "Demytheologizing," and the problem of the new hermeneutics.
Staff Not offered 1973-74

26.175 Faith and Tradition in India 4 Q.H.
An examination of selected historical, philosophical, and theological elements of Indian tradition, with special emphasis on post-Buddhist periods. The influence of Indian thought in the Far East is examined, as well as the influence of British Western civilization on Indian culture.
Prof. Pruett Not offered 1973-74

26.177 Understanding Religious Man 4 Q.H.
An examination and critical analysis of the major methods and definitions of religion, with emphasis on the anthropological, sociological, theological, and phenomenological means of isolating religious experience. The issues of the nature and function of religion are discussed.
Staff Fall and Winter Qtrs.

26.178 Religion in a Social Context 4 Q.H.
An exploration of the social forms of religion in America. The structures and roles of the church, synagogue, and sect are described and critically evaluated. In addition, emphasis is given to their function, with reference to general social structure, process, and reform.
Staff Not offered 1973-74

26.180 Myths and Dreams as Religious Experience 4 Q.H.
An inquiry into the basic dimensions of religious experience as illuminated by myths and dreams. A reading of myths from both Eastern and Western cultures in order to elucidate the world pictures they create. An attempt is made to identify the questions of man and world to which these myths respond.
Staff Fall and Winter Qtrs.

26.181 Paradigms for Religious Experience 4 Q.H.
A study of selected spiritual leaders and founders of religion such as Buddha, Socrates, Confucius, and Jesus, the unique dimensions of whose life and teachings provide paradigms for religious experience. It is an attempt to identify the concrete meaning of religious experience, to discover the means of communicating faith, and to describe the relations as well as differences between the "teacher" and "saviour".
Staff Spring and Summer Qtrs.

26.182 Religion in the Age of Science 4 Q.H.
An examination of the problems posed by the interaction between religion and the natural

and social sciences. Representative selections from David Hume, Charles Darwin, Karl Marx, Sigmund Freud, Eric Ericson, and Ernest Troeltzch are used to interact with selections from Rudolph Bultmann, Teilhard de Chardin, Reinhold Niebuehr, Dietrich Bonhoeffer, and Paul Tillich.

Staff

Fall and Winter Qtrs.

26.183 Ways of Being Religious

4 Q.H.

An identification and appraisal of different ways of approaching religion: the dogmatic, the rational, the mythical, the ritualistic, the mystical, the moral, and the pragmatic. It serves as an introductory course geared to the humanistic interests of the undergraduate student.

Staff

Spring and Summer Qtrs.

26.190, 191, 192 Honors Program

(each) 4 Q.H.

Staff

All Quarters

26.201 Area Course: Mind and Language

(Prereq. 4 Q.H. of philosophy or consent of instructor) 4 Q.H.

Contemporary challenges to mind-body dualism by linguistic philosophers, with emphasis upon their analyses of such concepts as intelligence, consciousness, will and rationality. Recent views concerning the effects of language on thought, perception, and world-views are also discussed.

Prof. DeAngelis

Fall and Winter Qtrs.

26.234 Advanced Philosophy of Religion (Prereq. 26.134 or consent of instructor) 4 Q.H.

A critical inquiry into such problems in religious belief as: the criteria for demythologization, the logic of prayer, faith, miracles, and revelation, and the general problem verification of religious belief.

Prof. Wellbank

Spring Qtr.

26.256 Seminar: Moral Philosophy

(Prereq. 26.155, 26.156, or consent of instructor) 4 Q.H.

An intensive examination of some meta-ethical problems associated with contemporary utilitarianism, such as the possibility of a non-cognitive utilitarianism, universalizability, and ethical argument, and such normative problems as social justice, human rights, and punishment.

Prof. Wellbank

Fall and Winter Qtrs.

26.265 Seminar in Wittgenstein

(Prereq. 8 Q.H. of philosophy or consent of instructor) 4 Q.H.

The overall development of Wittgenstein's thought, with special emphasis upon his later work as presented in the *Philosophical Investigations*. Subjects of importance include: language and thought, meaning, philosophical psychology, knowledge and experience, the nature of philosophy.

Prof. DeAngelis

Spring Qtr.

26.266 Seminar in Dewey (Prereq. 8 Q.H. of philosophy or consent of instructor) 4 Q.H.

Prof. Hacker

Spring Qtr.

26.268 Seminar in Russell (Prereq. 8 Q.H. of philosophy or consent of instructor) 4 Q.H.

Russell's thought, with emphasis on his views concerning knowledge, language, mind, and matter; his influence on contemporary thought. Some attention paid to his social and political writings.

Prof. Nathanson

Fall and Winter Qtrs.

26.272 American Faiths

4 Q.H.

Denominational institutions as influential forces in American society, and the religious and ideological commitments of Americans.

Staff

Spring Qtr.

26.274 Seminar in Judaism (Prereq. 8 Q.H. of philosophy or consent of instructor) 4 Q.H.

Prof. Pruett

Not offered 1973-74

26.275 Contemporary Religious Issues in the Western World

(Prereq. 26.174 or consent of instructor) 4 Q.H.

An analysis of some major developments in Christianity and Judaism in the context of industrialization and urbanization. An exploration of the impact of secularism upon the religions of the West as evident in Neo-Orthodoxy, Bonhoeffer's "Religionless Christianity," the radical theology of the death of God, and the trends toward a new humanism.

Staff

Fall and Winter Qtrs.

26.276 Mysticism: East and West (Prereq. 26.177, 26.180, or consent of instructor) 4 Q.H.

An inquiry into mystical experience through a comparative study of the writings of Christian, Buddhist, and Hindu mystics, and secondary interpretive sources. Areas taken up are: the potential oneness of man and God, the conflict of mystics with traditional forms of religion, and the possibility of a common cross-cultural basis for mysticism.

Prof. Pruett

Spring Qtr.

26.279 Issues in Contemporary Islam

(Prereq. 26.177, 26.180, or consent of instructor) 4 Q.H.

A discussion of such issues in 20th-century Islam as: Pan-Islamic movements; relations with Israel and the West; the Qu'ran as lawbook; social change in modern Islamic countries through Western influence; variation on the theme of Islam in Africa, Turkey, and Iran; and the Muslim view of history.

Prof. Pruett

Not offered 1973-74

Art**27.113 Creative Drawing**

4 Q.H.

Creative drawing in pen and ink, pencil, and crayon, with emphasis on form and texture.

Prof. Wells

Fall and Winter Qtrs.

27.114 Theory of Color and Design

4 Q.H.

Techniques and theories of design and color in painting.

Prof. Bishop

Not offered 1973-74

27.115 Basic Painting

4 Q.H.

Practice and creative expression in the basic techniques of painting, including study of color, space and form.

Prof. Bishop

Fall, Winter and Spring Qtrs.

27.116 History of Film Art I

4 Q.H.

A history of the development of film art from the late 19th century to the 1930s. Selected films are screened and studied. Lab fee.

Prof. Bishop

Fall and Winter Qtrs.

27.117 History of Film Art II

4 Q.H.

A history of the development of film art from the 1930s to the present. Selected films are screened and studied. Lab fee.

Prof. Bishop

Spring Qtr.

27.118 History of Art I

4 Q.H.

A survey of western art from prehistoric times to Renaissance.

Prof. Davis

Fall and Winter Qtrs.

27.119 History of Art II

(Prereq 27.118) 4 Q.H.

A survey of western art from the Renaissance to the 20th century.

Profs. Wells and Serenyi

Spring Qtr.

27.120 French Film

4 Q.H.

A survey of French film making from the late 19th century to the present. Selected films are screened and studied. Lab fee.

Prof. Bishop

Not offered 1973-74

27.121 Contemporary Directions in Cinema	4 Q.H.
A comparative study of selected films by major contemporary directors. Films are screened and studied. Lab fee.	
Prof. Bishop	Not offered 1973-74
27.131 Ancient Painting and Sculpture I	4 Q.H.
A concentrated study of art from prehistoric times to Greek civilization, including Egyptian, Mesopotamian, and Aegean art.	
Prof. Davis	Not offered 1973-74
27.133 Italian Renaissance Art I	4 Q.H.
A study of Italian painting and sculpture of the 14th and 15th centuries.	
Prof. Serenyi	Fall Qtr.
27.136 Classical Art	4 Q.H.
A concentrated study of Greek and Roman art.	
Prof. Davis	
27.137 Nineteenth Century Painting	4 Q.H.
European painting of the 19th century, with special emphasis on romanticism, realism, and impressionism.	
Prof. Sereni	Fall Qtr.
27.139 Medieval Painting and Sculpture	4 Q.H.
Romanesque and Gothic painting and sculpture from the 10th to the 15th centuries.	
	Winter Qtr.
27.141 Baroque and Rococo Painting	4 Q.H.
European painting of the 17th and 18th centuries.	
Prof. Wells	Fall, Winter, and Spring Qtrs.
27.143 Mexican Art	4 Q.H.
A concentrated study of Pre-Columbian art from the Archaic and Classical periods to the present.	
Prof. Davis	Fall and Winter Qtrs.
27.144 Latin American Art	4 Q.H.
The arts of architecture, sculpture, and painting of various countries of Latin America except Mexico, from Pre-Columbian times to the 20th century.	
Prof. Davis	Fall and Winter Qtrs.
27.148 European Graphic Arts	4 Q.H.
The history of graphic arts from the medieval period to the end of the 19th century. The development of engraving, woodcutting, etching, aquatint, and lithography and the work of representative artists.	
Prof. Wells	Spring 1974
27.149 American Graphic Arts	4 Q.H.
Development of the graphic arts in America from the colonial times to the present as shown through the works of representative artists.	
	Not offered 1973-74
27.150 History of Photography	4 Q.H.
A concentrated study of the development of photography, with special emphasis on American photographic art to the present.	
Prof. Holden	Not offered 1973-74
27.151 Modern Painting	4 Q.H.
Painting from the late 19th century to the present.	
Prof. Wells	Fall and Spring Qtrs.
27.152 Introduction to Art	4 Q.H.
A basic course in the characteristics of style, media, and techniques of painting, sculpture,	

- graphic arts, architecture, and film art. Serves as a foundation for future study in art history.
Prof. Wells Fall Qtr.
- 27.154 Italian Renaissance Art II** 4 Q.H.
Italian painting and sculpture of the 16th and early 17th centuries. Spring Qtr.
- 27.161 American Art I** 4 Q.H.
Development of American architecture, sculpture and painting from colonial times.
Prof. Holden Fall and Winter Qtrs.
- 27.162 American Art II** 4 Q.H.
American architecture, sculpture and painting from 1860 to the present.
Prof. Holden Spring Qtr.
- 27.171 Ancient Architecture** 4 Q.H.
The architecture of Egypt, Greece, and Rome.
- 27.172 Medieval and Renaissance Architecture** 4 Q.H.
Romanesque, Gothic, and Renaissance architecture.
- 27.173 Modern Architecture I** 4 Q.H.
A study of architecture and city planning from 1850 to 1920.
Prof. Serenyi Fall Qtr.
- 27.174 Modern Architecture II** 4 Q.H.
The great figures and the chief movements of 20th-century architecture and city planning.
Prof. Serenyi Winter and Spring Qtrs.
- 27.175 Late 19th-Century American Architecture** 4 Q.H.
A survey of the Stick and Shingle Architectural Styles, as well as more general developments.
Introductory lectures are followed by student presentations on selected topics.
Prof. Holden Spring Qtr.
- 27.176 Contemporary Architecture** 4 Q.H.
Architecture and city planning since World War II, with special emphasis on their forms, theories, and social implications.
Prof. Serenyi Not offered 1973-74
- 27.177 History of Architecture** 4 Q.H.
A survey of the stylistic characteristics of architecture from ancient periods to the present.
Prof. Holden Fall and Winter Qtrs.
- 27.181 Oriental Art I** 4 Q.H.
The prehistoric arts of India, China, and Japan; the rise and spread of international Buddhist art; the national Indian styles of sculpture, architecture, and painting.
Not offered 1973-74
- 27.182 Oriental Art II** 4 Q.H.
National styles of painting, sculpture, architecture, ceramics, and printmaking in China, Korea, and Japan.
Not offered 1973-74
- 27.183 Seminar in Modern Art and Architecture**
(Prereq. one course in art history since the Renaissance) 4 Q.H.
Selected topics in modern art and architecture.
Prof. Serenyi Not offered 1973-74
- 27.295, 27.296, 27.297 Honors Program** (each) 4 Q.H.
Staff Fall, Winter, and Spring Qtrs.
- 27.291, 27.292, 27.293 Directed Study** (each) 4 Q.H.
Staff Fall, Winter, and Spring Qtrs.

Music

- 28.100 Music I** 4 Q.H.
Introduction to selected works of our musical heritage from earliest times to contemporary styles. Primarily a survey and listening course, with emphasis on styles, basic theory, forms, and the historical, social, and artistic periods which these works represent.
Staff Fall, Winter and Spring Qtrs.
- 28.101 Music II** (Prereq. 28.100, 28.102, 28.106, 28.10120) 4 Q.H.
An in-depth continuation of 28.100 aimed at the further development of appreciation and understanding of selected works of our musical heritage. The course consists of a detailed study of these works and their relationships to the artistic milieu in which they are created.
Prof. C. Norvish and Sonnenschein September 1974
- 28.102 Music Fundamentals** 4 Q.H.
Introduction to music notation. Course stresses melodic, rhythmic, harmonic, and contrapuntal idioms culminating in the creative application of materials.
Prof. Silverman Spring Quarter
- 28.103 Music Form** 4 Q.H.
The study of major musical works with emphasis on their structural design (binary and ternary forms, fugue, rondo, theme and variations, etc.).
- 28.106 Theory I, Tonal Techniques I** 4 Q.H.
Essentials of tonal technique: fundamentals, ear training, sight singing, and dictation.
Prof. Keaney Fall and Winter Qtrs.
- 28.107 Theory II, Tonal Techniques B** (Prereq. 28.100, 28.102, 28.106) 4 Q.H.
Advanced ear training, sight singing, dictation, and musical analysis; harmonic principles of chords and their inversions.
Prof. Keaney Spring Qtr.
- 28.108 16th-Century Counterpoint** 4 Q.H.
Sight singing, ear training, composition in contrapuntal forms, and writing of species counterpoint.
- 28.109 18th Century Counterpoint** (Prereq. 28.100, 28.102, 28.108) 4 Q.H.
Sight singing, ear training, composition in contrapuntal forms, and analysis of selected works of J. S. Bach.
- 28.112 Music of the Baroque** 4 Q.H.
The development of instrumental writing; evolution of opera, oratorio, and cantata in the works of such composers as Monteverdi, Corelli, Handel, Vivaldi, and J.S. Bach.
Prof. Keaney Spring Qtr.
- 28.113 Bach** 4 Q.H.
The music of J. S. Bach and of the era which produced him. Church and secular works are studied.
Prof. C. Norvish Fall and Winter Qtrs.
- 28.115 Music of the Classical Era** 4 Q.H.
The period of music history between Bach and Beethoven. Aspects of classical style in instrumental and vocal works are discussed. Emphasis is placed on the music of Haydn and Mozart.
Prof. Sonnenschein Spring Qtr.
- 28.116 Great Literature for Keyboard Instruments** 4 Q.H.
The study of music for keyboard instruments (clavichord, harpsichord, organ, pianoforte, and synthesizer) from the 16th century to present. Emphasis will be placed on the evolution of keyboard instruments and differences in techniques required to play them as developed by various composers.
Prof. Hache' Spring Qtr.

28.117 Medieval and Renaissance

4 Q.H.

The development of sacred and secular monohony, vocal and instrumental works, and of polyphonic music from its beginning to about 1600.

28.119 Since Webern: The Avant-Garde

4 Q.H.

The avant-garde in music; total serialism, musique concrete, electronic music, chance music. The avant-garde in jazz, folk, rock, and pop.

28.120 Survey of Music History

4 Q.H.

An inclusive study of the men, ideas, and events that have shaped music history from ancient times through the Renaissance, Baroque, Classical, and Romantic eras to our own time. Among the composers whose works are studied are: Josquin, Bach, Mozart, Beethoven, Wagner, Mahler, and Stravinsky.

Prof. C. Norvish

Fall and Winter Qtrs.

28.123 Music of the Romantic Era

4 Q.H.

Romantic realism and idealism in the 19th century. Emphasis is placed on historical, nationalistic, and literary influences in music. Composers studied include: Beethoven, Schumann, Schubert, Berlioz, Liszt, Chopin, Verdi, Wagner, Brahms, Tchaikovsky, and Mahler.

Profs. Silverman and Snyder

Fall, Winter, and Spring Qtrs.

28.124 Traditional Folk Music of the Western World

4 Q.H.

A study of ethnic music of Europe, sub-Saharan Africa, and North and South America and their influence in Western musical culture.

Prof. Silverman

Fall and Winter Qtrs.

28.125 Great Choral Literature

4 Q.H.

Analysis of sacred and secular choral literature from medieval to contemporary times.

Mr. Jacobson

Fall and Winter Qtrs.

28.126 Music as a Means of Social Expression

4 Q.H.

A general and philosophical view of music in Western culture. Emphasis is on social themes (war-peace, love-rejection), rather than on musical form. Pertinent examples from the other arts are used.

28.135 Music of the U.S.A.

4 Q.H.

American music from Puritan psalm singing to the present time. Folk music of ethnic origin concert music, ragtime, jazz, and contemporary styles are discussed.

28.136 Music in Popular Culture

4 Q.H.

Emphasis on the 20th century, especially the last 20 years. Thought is given to various subcultures as seen in folk, jazz, rock, and soul. Reference is made to popular music of other countries.

Prof. Tesson

Fall, Winter, and Spring Qtrs

28.138 Nationalism in Music

4 Q.H.

A study of national schools of music. Among the composers studied are: the Russian "Five" Smetana and Dvorak of Bohemia, Sibelius of Finland, Grieg of Norway, Gade of Sweden, Liszt and Bartok of Hungary, Gottschalk, MacDowell, and Ives of the U.S., and others.

Prof. Silverman

Spring Qtr

28.139 The Music of Non-Western Societies

4 Q.H.

A survey of the music of African, southeast Asian, Indian, and near Eastern societies and the social and spiritual functions of music in these cultures.

28.140 Mozart

4 Q.H.

A musical development from child prodigy to mature artist is traced from his own letters and from biographies. Many of his major works, including opera, symphonies, concertos, and chamber music, are analyzed in detail.

28.141 20th-Century Music: Debussy to Schoenberg

4 Q.H.

The developments in music from 1900 to mid-century. Impressionism, Expressionism, Neo-

Classicism, Post Romanticism, and Neo-Nationalism.

Prof. Hache'

Fall and Winter Qtrs.

28.142 Stravinsky

4 Q.H.

His life and works; *Le Sacre, Petrouchka, Symphony of Psalms*, and more recent works are given detailed attention. His contributions to 20th-century style—neo-classicism, pan-diatonicism, additive style—are analyzed and his strong influence on other composers is noted.

28.145 Beethoven

4 Q.H.

An analysis of the complex personality and art of this major figure. His relation to the turbulent times in which he lived; his role in classical and romantic music.

Prof. Snyder

Fall and Winter Qtrs.

28.146 Mahler

4 Q.H.

A study of his major works and aesthetic principles. His many large scale symphonic and vocal works will be viewed in two ways:

1. as a consumation of 19th-century Romanticism, and
2. as a forerunner of 20th-century Expressionism.

Prof. C. Norvish

Spring Qtr.

28.160 The Symphony

4 Q.H.

A study of the symphony as the major genre in the classical, romantic and contemporary periods. Works by Haydn, Mozart, Beethoven, Schumann, Tschaikovsky, Brahms, Sibelius, Prokofiev, and others are studied.

Profs. Sonnenschein and Nadeau

Fall, Winter and Spring Qtrs.

28.170 Chamber Music

4 Q.H.

Ensemble pieces for small groups. Examples for analysis are selected from all periods from the Baroque to the present.

28.180 Introduction to Opera

4 Q.H.

Analysis of opera as a dramatic form. Aria, recitative, ensemble, and other basic elements of opera are isolated and discussed. Numbers Opera, Music Drama, and Singspiel are some of the types of opera considered. Composers whose works are analyzed include Mozart, Wagner, Verdi, and Puccini.

Prof. Snyder

Fall and Winter Qtrs.

28.181 Contemporary Opera

4 Q.H.

Almost every major composer including Schoenberg, Berg, Bartok, Stravinsky, Hindemith and Poulenc have contributed to the opera repertory, thus illustrating 20th century style. Among the works studied are: *Wozzeck, The Rake's Progress, Dialogue of the Carmelites*, and *Bluebeard's Castle*.

Prof. Snyder

Spring Qtr.

28.182 Wagner's Ring Cycle

4 Q.H.

An in-depth study of Wagner's Cycle of music drama; *Das Rheingold, Walkure, Siegfried, Gotterdammerung*. Wagner's compositional techniques (e.g., the use of leitmotif and musical metaphor) is examined in detail.

28.190 The Concerto

4 Q.H.

The concerto is studied from its origins in the Baroque era to its crystalization during the 18th and 19th centuries. Concerti grossi, as well as solo works for various instruments, are studied in detail.

28.200 Jazz

4 Q.H.

Jazz from its origins in New Orleans to the avant-garde experiments of today. The rhythmic, harmonic, instrumental, and stylistic characteristics of jazz are analyzed. Attention is given to the work of creative jazz artists such as Armstrong, Beiderbecke, Parker, Ellington, and Coltrane.

Profs. Mitchell and Tesson

Fall and Winter Qtrs.

28.201 Jazz II

(Prereq. 28.200 Jazz I) 4 Q.H.

In-depth study of various recorded works of important jazz performers/composers with respect to their work as creative artists. The study is not chronological, but deals with the dynamics of artistic growth and change. Special attention is given to developments of the last decade.

Profs. Mitchell and Tesson

Spring Qtr.

28.202 Black Artist in Music

4 Q.H.

A study of the contributions of black composers and performers to the world of music.

Prof. Mitchell

Spring Qtr.

28.230 Musical Performance I

(Prereq. audition or permission of instructor) 1 Q.H.

Participation in rehearsals and public performances and/or research, composition, arranging, conducting, solo and ensemble activity, etc., with the Chamber Orchestra, the Early Music Players, the NU Chorus, the NU Bands, or other ensembles, under the supervision and coaching of a faculty member of the Music Department. The student's progress will be evaluated at the end of the quarter by audition or otherwise.

28.231 Musical Performance II

1 Q.H.

28.232 Musical Performance III

1 Q.H.

28.233 Musical Performance IV

1 Q.H.

(Continuations of 28.230)

Drama and Speech

29.100 Public Speaking

3 Q.H.

A participation course for students interested in acquiring skills and experience in public communication. Emphasis on conversational delivery, organization, and audience analysis.

Staff

Spring and Summer Qtrs.

29.101 Public Speaking

(Prereq. 29.100) 3 Q.H.

Speech patterns which involve effective discussion; analysis, evidence, and reasoning as factors in convincing and persuading people.

Staff

Not offered 1973-74

29.102 Effective Speaking

3 Q.H.

The study of verbal and nonverbal features of communicative and expressive utterance. Consideration of principles and methods of effective communication in the preparation and delivery of various types of speeches.

Staff

All Quarters

29.105 Argumentation and Debate

(Prereq. 29.100 or 29.102 or consent of instructor) 4 Q.H.

Argumentation and debate presented as techniques of a free society, bringing reasoned discourse to bear on personal and social problems for purposes of decision and action. Attention is given to the various forms of debating technique.

Prof. Woodnick

Not offered 1973-74

29.106 Speech Fundamentals

3 Q.H.

An overview of speech communication, examining areas of voice and articulation, oral interpretation, and public speaking.

Staff

Fall and Winter Qtrs.

29.107 Interpersonal Communications

4 Q.H.

Ways of becoming more aware of self and one's relation to others. An exploration of various options for communicating and increasing one's knowledge of group process.

Profs. Woodnick and Rothbard

Fall and Winter Qtrs.

29.108 Business and Professional Speaking

4 Q.H.

Practice on oral presentations, group communication, conference and discussion techni-

ques, interview methods, and occasion speaking. The course combines performance aspects with case study methods of communication on the professional level.

Profs. Woodnick and Eastman

All Quarters

29.109 Speech for the Theatre

(Prereq. 29.110) 4 Q.H.

Special speech problems confronting actors performing in classical and contemporary theatre.

To be announced

Winter Qtr.

29.110 Voice and Articulation

4 Q.H.

The study of voice technique: emphasis on pitch, projection, articulation, and vocal variety. A combination of theory and practical application.

Profs. Woodnick and Eastman and Mrs. Littlefield

All Quarters

29.111 Oral Interpretation

4 Q.H.

Application of basic vocal techniques to the dramatic reading of prose, poetry, and drama. Through literary analysis the author's meaning is understood and, by means of oral reading skills, communicated to an audience.

Prof. Eastman

Fall and Winter Qtrs.

29.112 Advanced Voice and Articulation (Prereq. 29.110 or consent of instructor) 4 Q.H.

Development and application of vocal technique acquired in 29.110. Emphasis on vocal analysis, flexibility, regional patterns of speech.

Prof. Woodnick

Spring and Summer Qtrs.

29.113 Effective Speaking Workshop

1 Q.H.

Communication through individual speaking and small group conferences.

Staff

Spring and Summer Qtrs.

29.114 Advanced Oral Interpretation

(Prereq. 29.111) 4 Q.H.

Further development of oral reading skills acquired in 29.111. In addition, the course includes work with accents and dialects, study of reader's theatre, and an investigation of classical and modern philosophies of the art.

Prof. Eastman

Spring Qtr.

29.115 Theories of Persuasion

4 Q.H.

Persuasive discourse as it effects and refutes the process of dynamic social change; approaching critically the theories of persuasion derived from historical, philosophical, and psychological sources and their application to contemporary problems of politicking, mass media, and advertising as they influence attitude, opinion, and action.

Prof. Rothbard

Fall and Winter Qtrs.

29.116 Persuasive Techniques

(Prereq. 29.115) 4 Q.H.

Application of the principles of persuasion to preparation and delivery of speeches and to critical analysis of modes of persuasion in representative speeches.

Prof. Rothbard

Spring Qtr.

29.117 Group Discussion

4 Q.H.

Focus on the task-oriented group; development of skills in decision-making, problem-solving, membership, and leadership. Both the content and the process are discussed and analyzed.

Prof. Rothbard

Spring Qtr.

29.118 Speech Communication in Education

4 Q.H.

Through lectures, discussions, and performance projects an investigation is made of several activities. They are: conference and discussion techniques, both in decision-making situations and as teaching techniques; personal interviews, collective bargaining, and various speech situations involving the teacher's several audiences.

Prof. Eastman

Fall and Winter Qtrs.

29.119 Explorations in Communication

4 Q.H.

Designed to provide basic knowledge and understanding of the processes involved in the

transference of meanings. An analysis of contemporary concepts of human communication. Projects in examining cases of communication breakdowns, feedback systems, problems of modern channels, and sender-receiver analyses.

Mrs. Littlefield

Fall and Winter Qtrs.

29.120 Introduction to Theatre Arts

(for non-Drama majors) 4 Q.H.

A brief view of the historical development of acting, directing, and production design. Emphasis on appreciation of contemporary theatrical forms.

Staff

Fall and Winter Qtrs.

29.121 Survey of the Theatre I

4 Q.H.

Introduction to the drama as a dynamic medium of human expression; historical development of the theatrical form. Reading and analysis of selected plays as they relate to form, genre and style from the viewpoint of audience and artist.

Prof. Blackman

Fall and Winter Qtrs.

29.122 Survey of the Theatre II

4 Q.H.

Introduction to the theatre as a collaborative art form (theoretical and practical), with an emphasis upon acting, directing, designing, lighting, and the necessities of theatre economics.

Mr. Bailey

Winter and Spring Qtrs.

29.123 Propaganda

(Prereq. 29.115 or 29.119) 4 Q.H.

A descriptive and analytical survey of propaganda techniques and devices used in a conscious attempt to manipulate and ultimately control behavior.

Prof. Rothbard

Fall and Winter Qtrs.

29.127 The Mass and the Media

4 Q.H.

An exploration of the many media through which man expresses himself: i.e., music, art, film, radio, television, theatre, graffiti. Supplementing the course are lecturers, films, and attendance at various productions.

Prof. Woodnick

Fall and Winter Qtrs.

29.130 Makeup

4 Q.H.

The principles of, the reasons for, and the materials used in makeup for the theatre, television, and films. The practical application of types and styles of makeup: straight, old-age, character, and corrective.

Winter Qtr.

29.150 Elementary Acting I

(Prereq. Drama major or consent of instructor) 4 Q.H.

Fundamental techniques of stage use. The actor and his stage environment. Improvisations for strengthening imagination and increasing freedom. Analysis of scripts for work on performed scenes.

Prof. Kaplan

Fall and Winter Qtrs.

29.151 Elementary Acting II

(Prereq. 29.150) 4 Q.H.

Fundamental analysis of the script, including physicalizations and vocal scoring; character analysis; scenes performed for classroom analysis.

Prof. Kaplan

Spring Qtr.

29.152 Intermediate Acting III

(Prereq. 29.151) 4 Q.H.

Further development of the actors tools, script and character scoring, exercises for physical and psychological freedom. In-class scenes as works-in-progress.

Prof. Kaplan

Spring Qtr.

29.156 Stage and Body Movement

(Prereq. Drama major or permission of instructor) 4 Q.H.

A workshop course in movement and improvisation techniques, which explore inner resources and allow the actor greater freedom of expression on the stage.

Spring Qtr.

29.160 Concepts of Direction (Prereq. Drama major or permission of instructor) 4 Q.H.
Theories of dramatic presentation through analysis of selected historical developments. Purposes and techniques of theatrical direction as they relate to script analysis, production style, pictorial composition, rhythmic evolution, emphatic responses.
Prof. Blackman Winter Qtr.

29.161 Problems in Direction 4 Q.H.
Experimentation in theory related to the staging of classical and modern drama. Analysis of plays for actual production; casting, rehearsals, character interpretations. Each student is responsible for the production of a one-act play.
Prof. Blackman Spring Qtr.

29.163 Play Production 4 Q.H.
The basics of play production for recreation and education leaders in schools, camps, or settlement houses. Both formal and informal dramatics activities are explored, along with the problems involved in preparing the creative, performing, design, and technical aspects of a production.
Mr. Bailey Fall and Winter Qtrs.

29.164, 29.165, 29.166, 29.167 Practicum in Play Production 1 Q.H.
Laboratory practice in technical theatre: scene building and painting, and the performing of backstage functions. To be repeated for credit up to four credits.
Prof. Bailey All Quarters

29.170 Scenic Production 4 Q.H.
Principles which underlie the coordination and execution of scenery for the stage; examination of different kinds of scenery, tools, equipment, construction materials, and techniques; handling of scenery and basic scene painting. Laboratory work: constructing and painting scenery for University productions.
Mr. Bailey Winter and Spring Qtrs.

29.171 Design and Lighting (Prereq. 29.170) 4 Q.H.
The basic principles of design and lighting for the stage; historical analysis of composition and design from classical to modern periods; execution of designs for productions.
Mr. Bailey Not offered 1973-74

29.172 Scenic Design for the Stage (Prereq. 29.17) 4 Q.H.
Practical problems of scene design and methods of approach. Classwork and projects in analysis of a script in terms of visual requirements; elements of design and their application to scenery; methods of inspiration; presentation of ideas including sketches, renderings, models, working drawings, and elevations; basic scene painting and evaluation of designs. Laboratory work includes designing and executing scenery for University productions.
Mr. Bailey Not offered 1973-74

29.173 Lighting Design for the Stage (Prereq. 29.170) 4 Q.H.
Basic principles and practices of stage lighting, including the qualities and functions of light, lighting instruments and controls, basic electricity, color in light, and analysis of the script in terms of light requirements. Students develop light plots and schedules for various kinds of stage productions, and frequently design University productions. Class work includes laboratory work on lighting crews for University productions.
Mr. Bailey Spring Qtr.

29.174 Scene Painting 4 Q.H.
The history of scene painting and ornament from classical to contemporary times. Studio organization, color, color theory, equipment, tools, materials, and costs involved with painting stage scenery. Projects and exercises in the use of different media, matching colors, painting of textures, light and shade, and the use of stencils and physical textures. Laboratory sessions include painting stage scenery for University productions.
Mr. Bailey Spring Qtr.

29.175 Costuming for the Stage

4 Q.H.

The theoretical and practical aspects of costuming are covered through a combined lecture/laboratory format. Basic design concepts, techniques of rendering costume plates, pattern drafting, draping, fabric usage, and special effects. Particular emphasis is given to problems of costuming for high school and college theatres.

Fall Qtr.

29.176 Historic Costume and Design

(Prereq. 29.175) 4 Q.H.

A survey of historic costume and civil dress through the ages of Western man. Its adaptation and relevance to the problems involved in designing for high school and college stages are the foundation for this area of study. Emphasis is on the use of research sources for design assignments within various periods.

Spring Qtr.

29.180 Playwriting

4 Q.H.

The principles and practices of modern dramatic composition: characterization, plot, plot structure, dialogue, and other dramaturgical elements as seen in the one-act play. The writing of brief scenes; the dramatic; and the one-act play.

Prof. Phillips

Fall and Winter Qtrs.

29.185 Children's Theatre

4 Q.H.

Theories and methods of relating creative techniques to children's programs in schools, churches, and recreational facilities. Analysis of literature in preparation for production of children's plays.

Prof. Blackman

Spring and Summer Qtrs.

29.186 Educational Theatre

4 Q.H.

Drama and drama activities in community, social, health, and educational agencies. Organizing and directing young people's theatre programs.

Not offered 1973-74

29.200 History of the Theatre

4 Q.H.

Development of the theatre and the drama of Greece and Rome, medieval Europe, Elizabethan and Restoration England, and 17th-century France; an examination of playwriting, acting styles, scene design, theatre architecture, and the relationship among these elements.

Prof. Phillips

Fall and Winter Qtrs.

29.201 History of the Theatre

4 Q.H.

Development of the European theatre of the 18th, 19th, and early 20th centuries; growth and development of the proscenium theatre; the emphasis upon naturalistic and realistic presentation; theatre innovations.

Prof. Phillips

Spring and Summer Qtrs.

29.202 The Classic Theatre of Greece and Rome

4 Q.H.

The beginnings of theatre and its growth as a potent institution and art form. A detailed study of the interrelation of the dramatic form, theatre structure, and works of major playwrights.

Not offered 1973-74

29.205 The Restoration Theatre

4 Q.H.

The philosophical, social, historical, and critical influences upon the Restoration theatre and its dramatists.

Not offered 1973-74

29.210 The American Theatre

4 Q.H.

The American theatre from the Revolutionary War to the present.

Prof. Phillips

Fall and Winter Qtrs.

29.211 The Theatre of Williams, Miller, and Albee

4 Q.H.

An intensive study of the works of three major post-World War II American playwrights.

Prof. Phillips

Spring and Summer Qtrs.

29.230 Contemporary Theatre

4 Q.H.

The traditional and contemporary forces that shape the trends in present-day theatre. Emphasis upon the works and contributions of Wilder, Pirandello, Brecht, Bolt, Ghelderode, Ionesco, Osborne, Pinter, the major absurdist, and the present experimentalists.

Prof. Kaplan

Fall and Winter Qtrs.

29.231 The Theatre of the Absurd

4 Q.H.

The Theatre of the Absurd as a mirror of present existentialist thinking and its effects upon the history of Western drama.

Prof. Kaplan

Spring and Summer Qtrs.

29.240 Drama Criticism

4 Q.H.

An examination of both the major historical statements of drama theory and contemporary drama criticism as evidenced in journalistic play reviews. Students prepare reviews of local productions.

Prof. Phillips

Spring Qtr.

29.290 Directed Study

4 Q.H.

Staff

All Quarters

English

Prerequisite for all English courses is Freshman English (30.113 and 30.114) or equivalent.

30.104 Advanced Expository Writing

4 Q.H.

A practical course in writing direct prose with clarity and precision. Includes various methods of development; diction, style, tone; the article, review, and other forms.

Prof. Norvish

All Quarters

30.108 Creative Writing: Poetry

4 Q.H.

Practice in various forms and strategies of verse, with specific assignments in different modes; discussion and criticism of student work and selected texts.

Mr. DeRoche

All Quarters

30.109 Creative Writing: Fiction

4 Q.H.

Conducted as an introduction to fiction writing, with emphasis on the short story. The course is open to students in all disciplines, whether or not they have previously written fiction. The minimum requirements are 10,000 words of original work divided into three assignments. Reading and discussion of manuscripts written by the students occupy the bulk of class time.

Mr. Sandberg

All Quarters

30.110 Literary Analysis: Poetry

4 Q.H.

Close reading of selected poems, mastery of critical terms, practice in varied critical approaches to poetry. A number of critical papers are written. Required of English majors.

Staff

Fall and Winter Qtrs.

30.111 Literary Analysis: Fiction

4 Q.H.

Formal study of selected novels and short stories, mastery of critical terms, practice in varied critical approaches. A number of critical papers required.

Staff

Spring and Summer Qtrs.

30.112 Literary Analysis: Drama

4 Q.H.

Formal study of selected plays, mastery of critical terms, practice in varied critical approaches. A number of critical papers required.

Staff

Spring and Summer Qtrs.

30.113 Freshman Writing

4 Q.H.

Important principles of logic and rhetoric applied to exposition and argumentation writing; review of sentence structure, punctuation, and paragraphing; extensive reading and analysis of the essay form; theme assignments.

Staff

All Quarters

30.114 Introduction to Literature

(Prereq. 30.113) 4 Q.H.

An introduction to literary forms: poetry, prose fiction, and drama. Intensive reading various forms and discussion of different approaches to literature.

Staff

All Quarters

30.115 Great Themes in Literature

(Prereq. 30.114) 4 Q.H.

Content determined by instructor, who chooses a theme and a number of books from different periods to illustrate it.

Staff

Winter and Spring Qtrs.

30.120 Introduction to Linguistics

4 Q.H.

Theories of the nature and origin of language; review of historical and comparative linguistics; differences between written and spoken language, prescriptive and descriptive grammars; structural and generative-transformational phonology, morphology, and syntax; distinctive features; current trends; investigation into dialectology and linguistic field work; methodology regarding unwritten languages.

Fall and Winter Qtrs.

30.121 Foundations of the English Language

4 Q.H.

Development of modern English from pre-Anglo Saxon beginnings; effects of Roman, Scandinavian, and Norman invasions; dialect geography; evolutionary changes, word formation and borrowing; English as an international language; origins of writing and problems of spelling.

Spring and Summer Qtrs.

30.124 Traditional Grammar

4 Q.H.

A reappraisal of traditional grammar in the light of recent advances in grammatical theory; the practical application of such grammar in both studying and teaching English as a medium of expression; supplementary readings by way of transition to the newer grammars.

Fall and Winter Qtrs

30.125 Grammars of English

4 Q.H.

An attempt to understand and apply the newer grammar, especially the structural.

Spring and Summer Qtrs

30.126 Transformational Grammar

4 Q.H.

The development of the theories of generative-transformational grammars by Noam Chomsky and others, and the development of the skill to construct and operate specific generative-transformational grammars.

Spring and Summer Qtrs

30.130 Introduction to Semantics

4 Q.H.

The relation between language and behavior, levels of abstraction in communication, habits of evaluation of linguistic phenomena, and the modification of such habits in the direction of human understanding and survival.

Fall and Winter Qtrs

30.140 The Novel of Violence

4 Q.H.

The hard-boiled tradition in American literature. Works by Fenimore Cooper, Owen Wister, Jack Scheafer, Ernest Hemingway, Dashiell Hammett, Raymond Chandler, and others are discussed in terms of their response to the conflict between the ideal of community and the ideal of individualism. Critical theories of D.H. Lawrence, R.W.B. Lewis, Leslie Fiedler, Leo Marx, A.N. Kaul, and others are considered.

Prof. Parker

Fall and Winter Qtrs

30.141 Science Fiction

4 Q.H.

The myths and rhetorical (scientific and pseudo-scientific) strategies of science fiction from Mary Shelley's *Frankenstein* through current authors such as Vonnegut, Bradbury, Heinlein, Clarke.

Prof. Goshgarian

All Quarters

30.142 The Psychological Novel	4 Q.H.
Concentration on 20th-century novels whose themes stress individual behavior and motivation, and whose form and style often try to imitate human mental and emotional processes. Authors studied include: Kafka, Dostoevski, Faulkner, Conrad, and Lawrence.	
Prof. Sullivan	Spring and Summer Qtrs.
30.143 Autobiography and Fiction	4 Q.H.
Autobiography as the product of creative and therefore fictional impulses is studied by examining the way autobiographers shape the facts of their lives into patterns reflecting attitudes toward self. This study is extended to novels narrated by fictional self-historians.	
Prof. Roemer	Fall and Winter Qtrs.
30.144 Literature of the Absurd	4 Q.H.
Outstanding novels of the 20th century, with emphasis on literary trends and implied social outlook.	
Staff	Fall and Winter Qtrs.
30.151 The Modern Novel	4 Q.H.
Outstanding novels of the 20th century, with emphasis on literary trends and implied social outlook.	
Staff	Fall and Winter Qtrs.
30.152 Modern Drama	4 Q.H.
Native and European drama since 1880, with emphasis on the relationship between drama and society in the 20th century.	
Staff	Spring and Summer Qtrs.
30.154 The Modern Short Story	4 Q.H.
Selected British and American writers of the short story, with close attention to contemporary practitioners (Salinger, Malamud, Roth) as well as to major figures (Joyce, Lawrence, Faulkner).	
Prof. Griffin	Fall and Winter Qtrs.
30.160 New Topics in Literature	4 Q.H.
This experimental course deals with a different topic each fall/winter and spring/summer, providing the opportunity for students to study unusual or nontraditional aspects of literature. Sample possibilities: Gothic and Horror Fiction, Victorian Children's Literature, and the Literature of Utopia. Topic will be preannounced.	
	Fall and Winter Qtrs.
30.161 New Topics in Literature	4 Q.H.
Not a continuation of 30.160, but the same course with a different topic.	
	Spring and Summer Qtrs.
30.162 Major Figure	4 Q.H.
Devoted entirely to the work of a single writer, with a different one each fall/winter and spring/summer: i.e., Wordsworth, Joyce, Tolstoy, Dickens. Subject will be preannounced.	
	Fall and Winter Qtrs.
30.163 Major Figure	4 Q.H.
Same as 30.162, but with a different writer.	
	Spring and Summer Qtrs.
30.170 Survey of English Literature	4 Q.H.
English literature to 1800.	
Staff	Fall and Winter Qtrs.
30.171 Survey of English Literature	4 Q.H.
English literature from 1800 to the present.	
Staff	Spring and Summer Qtrs.
30.180 Survey of American Literature	4 Q.H.
American literature to 1860.	
Staff	Fall and Winter Qtrs.

30.181 Survey of American Literature

4 Q.H.

American literature from 1860 to the present.

Spring and Summer Qtrs.

30.182 Major American Novels

4 Q.H.

An intensive analysis of the themes, forms, and techniques of American novelists of the 19th and early 20th centuries. Critical papers are required.

Prof. Trachtenberg

Fall and Winter Qtrs.

30.183 Major American Novels

4 Q.H.

An intensive analysis of the themes, forms, and techniques of modern American novelists. Critical papers are required.

Prof. Trachtenberg

Spring and Summer Qtrs.

30.186 Early American Literature

4 Q.H.

The development of early American culture of the colonial and federal periods. Letters, narratives, verse, polemics, the Federalist Papers, etc.

Prof. Lesser

Fall and Winter Qtrs.

30.187 New England Renaissance

4 Q.H.

An intensive survey of transcendentalism, and relevant works of Melville and Hawthorne.

Fall and Winter Qtrs.

30.188 American Romanticism

4 Q.H.

An intensive survey of Poe, Melville, Whitman, Dickinson, and others.

Spring and Summer Qtrs.

30.189 American Realism

4 Q.H.

American literature from the Civil War to Norris, Crane, Twain, and James.

Prof. Nagel

Fall and Winter Qtrs.

30.190 Modern American Literature

4 Q.H.

Fiction, drama, and poetry from the turn of the century to the mid-forties.

Prof. Nagel

Spring and Summer Qtrs.

30.200 Western World Literature I

4 Q.H.

The major literary forms of classical Greece, with special attention to the epic, drama, and dialogue. In-depth study of selected works of Homer, Plato, Aristotle, and the dramatists.

Fall and Winter Qtrs.

30.201 Western World Literature II

4 Q.H.

The major literary forms of the Roman Empire, with special attention to the epic, drama, and oration. Emphasis on the works of Virgil, Horace, Ovid, and Cicero.

Spring and Summer Qtrs.

30.202 Western World Literature III

4 Q.H.

The major literary forms in the European tradition from the medieval period to the 19th century. Selected readings from the writings of Dante, Calderon, Milton, Racine, Corneille, Johnson, and Goethe.

Fall and Winter Qtrs.

30.203 Western World Literature IV

4 Q.H.

The major literary forms of the 20th century. Readings from major American and European figures are surveyed, with special emphasis on Kafka, Camus, Sartre, Ionesco, Beckett, and Albee.

Prof. Sands

Spring and Summer Qtrs.

30.204 Practical Writing

4 Q.H.

Designed for people who wish to write professionally, but who are not primarily interested in writing fiction or poetry. Discussions on how to write and edit essays, advertisements, feature stories, articles, film strips, news stories, news releases, technical manuals, house organs, industrial films, direct mail, radio commercials. Guest lecturers from various professions

appear from time to time.

Prof. Parker

All Quarters

30.209 Advanced Fiction Writing (Prereq. 30.109 or permission of instructor) 4 Q.H.

Reading and discussion of student manuscripts (longer and more complex than those developed in 30.109, Creative Writing: Fiction).

Mr. McHale

All Quarters

30.210 Major British Novelists

4 Q.H.

The 18th-century English novel, with special attention to Defoe, Fielding, Smollett, Sterne, the Gothic novelists, and Austen; the development of the English novel and the characteristic quality of 18th-century fiction.

Fall and Winter Qtrs.

30.211 Major British Novelists

4 Q.H.

The 19th-century English novel, with special attention to the Brontës, Thackeray, Trollope, Eliot, Meredith, Gissing, and Hardy; the Victorian frame of mind as seen in the novels.

Spring and Summer Qtrs.

30.218 Medieval English Literature

4 Q.H.

Major works in Middle English: *Sir Gawain*, *Piers Plowman*, and *Pearl*.

Profs. Blanch and Kroll

Fall and Winter Qtrs.

30.219 Major British Dramatists: Restoration and 18th Century

4 Q.H.

Major dramatists from 1660—1800. Among those studied are: Etherege, Wycherley, Congreve, Dryden, Addison, Goldsmith, and Sheridan.

Spring and Summer Qtrs.

30.220 Major British Dramatists: Elizabethan and Jacobean

4 Q.H.

The origin, theme, form, technique, and poetry of such dramatists as Kyd, Webster, Tourneur, Fletcher, and Beaumont, with particular emphasis on the works of Marlowe, Jonson, and Ford.

Fall and Winter Qtrs.

30.221 Major British Dramatists: 19th Century and Modern

4 Q.H.

British drama with particular emphasis on the poetic and experimental in the works of Shaw, Synge, Yeats, O'Casey, Eliot, Behan, Pinter and Beckett.

Prof. Bernstein

Fall and Winter Qtrs.

30.222 Chaucer

4 Q.H.

Selected *Canterbury Tales*.

Profs. Blanch and Kroll

Fall and Winter Qtrs.

30.223 Chaucer

4 Q.H.

Selected *Canterbury Tales* and Chaucer's early poems.

Profs. Blanch and Kroll

Spring and Summer Qtrs.

30.224 Spenser

4 Q.H.

Selected early poems and portions of the *Faerie Queene*.

Prof. Blessington

Spring and Summer Qtrs.

30.225 Milton

4 Q.H.

Concentration on Milton's *Paradise Lost*, with supplementary readings in his minor poems and prose.

Prof. Blessington

Fall and Winter Qtrs.

30.230 Seventeenth-Century English Literature

4 Q.H.

Major writers of the first half of the century, with special emphasis on Bacon, Jonson, and the metaphysical poets Donne and Herbert; the effect of science on the literature and the thinking of the times.

Prof. Howes

Fall and Winter Qtrs.

30.231 Seventeenth-Century English Literature

4 Q.H.

Major writers of the second half of the century, with emphasis upon Dryden and Milton. Satire

as a literary genre and its relationship to the times.

Spring and Summer Qtrs.

30.236 Eighteenth-Century English Literature

4 Q.H.

Significant dramatic works of the period and the writings of Pope and Swift.

Prof. Weitzman

Fall and Winter Qtrs.

30.237 Eighteenth-Century English Literature

4 Q.H.

Writings of Dr. Johnson, Boswell, and Blake.

Prof. Weitzman

Spring and Summer Qtrs.

30.240 Nineteenth-Century English Literature: The Romantics I

4 Q.H.

The poetry of Blake, Wordsworth, Coleridge, and related critical material; the relationship between the poetry and the time.

Prof. Roemer

Fall and Winter Qtrs.

30.241 Early Victorian Literature, 1830-1870

4 Q.H.

Survey of the major literary forms of the period. Readings in Tennyson, Browning, Arnold, Carlyle, Mill, Ruskin, Dickens.

Prof. Sussman

Fall and Winter Qtrs.

30.242 Nineteenth Century English Literature: The Romantics II

4 Q.H.

The poetry of Byron, Shelley, Keats, and related critical material; the essays of Lamb, Hazlitt, and DeQuincey.

Prof. Roemer

Spring and Summer Qtrs.

30.243 Later Victorian Literature, 1870—1900

4 Q.H.

Emphasis on the movement toward "modernism" in the later 19th century. Readings in Pater, G.M. Hopkins, Wilde, Hardy, and the early work of G.B. Shaw and Conrad.

Prof. Sussman

Spring and Summer Qtrs.

30.246 Twentieth-Century Literature

4 Q.H.

The development of the British Novel from 1900 to 1920. Writers studied are: Conrad, Galsworthy, Bennet, Wells, Forster, Joyce, Lawrence, Ford.

Prof. Roby

Fall and Winter Qtrs.

30.247 Twentieth-Century Literature

4 Q.H.

The development of the British novel from 1920 to the present. Writers to be studied are Woolf, Orwell, Beckett, Cary, Amis, Snow, Murdoch, Fowles.

Prof. Roby

Spring and Winter Qtrs.

30.248 Sixteenth Century-English Literature

4 Q.H.

Fall and Winter Qtrs.

30.250 Shakespeare

4 Q.H.

A chronological approach to Shakespeare's plays, beginning with *Romeo and Juliet* and ending with *Julius Caesar*. Emphasis on diction, dramatic structure, and psychology.

Profs. Howes and Westlund

Fall and Winter Qtrs.

30.251 Shakespeare

4 Q.H.

Shakespeare's middle and last phases (*Hamlet* to *The Tempest*); selected plays.

Profs. Howes and Westlund

Spring and Summer Qtrs.

30.260 The Bible

4 Q.H.

A close study and textual analysis of selected books of the Bible. The assigned texts are especially considered in their historical and literary aspects.

Prof. Blois

Spring and Summer Qtrs.

30.261 Mythology

4 Q.H.

The mythological patterning of human experience; the philological and anthropological approaches to specific myths, especially those of the Greeks; and the themes of sacrifice and change.

Prof. Blois

Fall and Winter Qtrs.

- 30.262 Literary Criticism: Approaches to Literature** 4 Q.H.
Exercises and readings in ancient and modern theories of literature. Included are: Marxist, Freudian, Jungian and New Critical theories, as well as selections from Plato, Aristotle and the Romantics.
Prof. Nelson Fall and Winter Qtrs.
- 30.263 Modern Poetry I** 4 Q.H.
A study of the origin and development of modern poetry. Poets studied are: Hardy, Yeats, Robinson, Frost, Stevens, Moore, Eliot, and Pound. Recommended for students who have already had an introductory course in poetry.
Prof. Morse Fall and Winter Qtrs.
- 30.264 Modern Poetry II** 4 Q.H.
A continuation of 30.263, with emphasis on the later work of Eliot and Pound, William Carlos Williams, the Objectivists, the Fugitives (Ransom, Tate, Warren), Auden, Lowell, Roethke, Dylan Thomas, and the "new poets" from 1945 to 1960.
Prof. Morse Spring and Summer Qtrs.
- 30.266 Literary Criticism: Myth and Archetypal** 4 Q.H.
Exercises and readings in selected schools of myth and archetypal literary criticism.
Prof. Nelson Spring and Summer Qtrs.
- 30.267 Afro-American Literature** 4 Q.H.
A survey of the development and range of black American writers, emphasizing poetry and prose from the post-Civil War period to the present.
Mr. Hurreh Fall and Winter Qtrs.
- 30.268 Afro-American Literature** 4 Q.H.
Continuation of 30.267.
Mr. Hurreh Spring and Summer Qtrs.
- 30.269 The Black Novel** 4 Q.H.
A study of the black novel—its theme, structure, and style— and its historical, cultural, and literary importance.
Fall and Winter Qtrs.
- 30.270, 30.271 Junior Seminar** 4 Q.H.
Fall, Winter, and Spring Qtrs.
- 30.272 Studies in English Literature** 4 Q.H.
A seminar course on a special topic which is announced in advance. Examples: The Pre-Raphaelites, Literature and Psychology, and John Donne.
Fall and Winter Qtrs.
- 30.273 Studies in English Literature** 4 Q.H.
Continuation of 30.272.
Spring and Summer Qtrs.
- 30.274 Studies in American Literature I** 4 Q.H.
A seminar course on a special topic announced in advance. Examples: Puritanism, Early Drama, and The Genteel Tradition.
Fall and Winter Qtrs.
- 30.275 Studies in American Literature II** 4 Q.H.
Continuation of 30.274.
Spring and Summer Qtrs.
- 30.276 African Literature** 4 Q.H.
Mr. Hurreh Fall and Winter Qtrs.
- 30.280, 30.281 Senior Seminar** (each) 4 Q.H.
Fall Winter, and Spring Qtrs.

30.290, 30.291 Directed Study	(each) 4 Q.H. All Quarters
30.295, 30.296 Junior Honors	(each) 4 Q.H. All Quarters
30.297, 30.298 Senior Honors	(each) 4 Q.H. All Quarters

French

Prerequisites listed for Modern Languages are based on current course numbers at Northeastern. Equivalent course work done elsewhere will be considered acceptable to satisfy these prerequisites.

31.201 Elementary French I 4 Q.H.
Essentials of grammar; practice in speaking and reading; progressive acquisition of basic language skills.
Prof. Williams and Staff Fall and Winter Qtrs.

31.202 Elementary French II (Prereq. 31.201) 4 Q.H.
Continuation of grammar study and basic language skills; reading of French of increasing difficulty; practice in conversation.
Prof. Williams and Staff

31.203 Intermediate French I (Prereq. 31.202) 4 Q.H.
Continuation of grammar, oral practice, and the reading of selected texts.
Prof. Stephan and Staff

31.204 Intermediate French II (Prereq. 31.203) 4 Q.H.
Prof. Stephan and Staff

31.205 Reading French in the Arts and Sciences (Prereq. 31.202 or equiv.) 4 Q.H.
Designed for those students who wish to develop their reading skills, without regard to other aspects of the language such as speaking or writing. To this end, the grammar necessary for reading is stressed, together with vocabulary building. Scientific and nonscientific texts are read. This course is also very helpful for students, graduate and undergraduate, who need to pass a reading examination to fulfill specific degree requirements. However, it should be made clear that this course is not a substitute for 31.203 and 31.204 (Intermediate French).
Mr. Robinson Fall and Winter Qtrs.

31.217 French Literature in Translation 4 Q.H.
An elective course for all students, offering a study of some of the most significant works of French literature in translation. The topic will vary from year to year. Language majors would receive major credit for this course *only* by making special arrangements with the instructor for extra work to be done.
Mr. Robinson Spring and Summer Qtrs.

31.219 Cherchez la Femme! Women in French Literature of the 18th and 19th Centuries 4 Q.H.
A one-quarter course conducted in English of French literature in translation. An opportunity to see how woman is viewed by some of the great French novelists of the 18th and 19th centuries. The class meetings alternate between lectures and group discussions of literary, psychological, and sociological issues raised by the texts. A reading knowledge of French is desirable, but *not* essential.
Mrs. Gill Spring and Summer Qtrs.

31.227 French Composition and Conversation I (Prereq. 31.204) 4 Q.H.
Aiming at perfect speaking and writing ability: the basis of work is analysis of the language, oral and written reports and general discussions. Conducted in French.
Prof. Cedrone and Staff Fall and Winter Qtrs.

- 31.228 French Composition and Conversation II** (Prereq. 31.227) 4 Q.H.
Continuation of 31.227, with stress on individual work, free discussions, and compositions.
Conducted in French.
Prof. Cedrone and Staff Spring and Summer Qtrs.
- 31.231 Masterpieces of French Literature I** (Prereq. 31.204) 4 Q.H.
Introductory course in French literature. Selected works from the Middle Ages to the 18th century.
Prof. Gilman and Staff Fall and Winter Qtrs.
- 31.232 Masterpieces of French Literature II** (Prereq. 31.204 or equiv.) 4 Q.H.
Introductory course in French literature. Selected works from the 19th and 20th centuries.
Prof. Gilman and Staff Spring and Summer Qtrs.
- 31.233 Applied French Linguistics** (Prereq. 30.120) 4 Q.H.
For teachers or prospective teachers of French: phonemes and allophones, breath groups and sentences, intonation patterns, comparison between oral and written French.
Prof. Williams
- 31.243 French Classicism** (Prereq. 31.232 or equiv.) 4 Q.H.
Intellectual currents and other nondramatic literature of the 17th century.
Prof. Williams Fall and Winter Qtrs.
- 31.244 French Classicism** (Prereq. 31.232 or equiv.) 4 Q.H.
Dramatic literature of the 17th century. Plays of Corneille, Moliere, and Racine.
Prof. Williams Spring and Summer Qtrs.
- 31.245 French Literature of the 18th Century** (Prereq. 31.232, equiv.) 4 Q.H.
The progress of the philosophical spirit and rationalistic thinking as reflected in the works of Fontenelle, Bayle, Montesquieu, Voltaire, and others.
Prof. Fabrizi Offered 1974-75
- 31.246 French Literature of the 18th Century** (Prereq. 31.232 or equiv.) 4 Q.H.
The achievements of the spirit of enlightenment and the awakening of the romantic sensibility, as seen in such authors as Diderot, Rousseau, St. Pierre, and Beaumarchais.
Conducted in French.
Prof. Fabrizi Offered 1974-75
- 31.247 French Literature of the 19th Century** (Prereq. 31.232 or equiv.) 4 Q.H.
Romantic poetry and drama; the realist novel.
Prof. Stephan Offered 1974-75
- 31.248 French Literature of the 19th Century** (Prereq. 31.232 or equiv.) 4 Q.H.
Flaubert; Parnassian and Symbolist poetry.
Prof. Stephan Offered 1974-75
- 31.249 French Literature of the 20th Century** (Prereq. 31.232 or equiv.) 4 Q.H.
Narrative and dramatic prose writers prior to World War II, including Proust, Claudel, Gide, and Mauriac.
Prof. Fabrizi Fall and Winter Qtrs.
- 31.250 French Literature of the 20th Century** (Prereq. 31.232 or equiv.) 4 Q.H.
The prose literature of present-day France as illustrated by the works of Sartre, Camus, Ionesco, and others.
Prof. Fabrizi Spring and Summer Qtrs.
- 31.291, 31.292, 31.293, 31.294 Directed Study** 4 Q.H. (each)
Staff All Quarters
- 31.295, 31.296, 31.297, 31.298 Honors Program** 4 Q.H. (each)
Staff All Quarters

Spanish

Prerequisites listed for Modern Languages are based on current course numbers at Northeastern. Equivalent course work done elsewhere will be considered acceptable to satisfy these prerequisites.

32.301 Elementary Spanish I

4 Q.H.

Essentials of grammar; practice in pronunciation; progressive acquisition of a basic vocabulary and idiomatic expressions.

Prof. Kitchin and Staff

Fall and Winter Qtrs.

32.202 Elementary Spanish II

(Prereq. 32.201) 4 Q.H.

Continuation of grammar study. Oral and written exercises; reading of basic Spanish prose.

Prof. Kitchin

32.203 Intermediate Spanish I

(Prereq. 32.202) 4 Q.H.

Intensive grammar review. Reading of modern prose and poetry, with occasional oral or written translation. Basic elements of composition and conversation practice based on assigned readings.

Prof. Modee and Staff

32.204 Intermediate Spanish II

(Prereq. 32.203 or equiv.) 4 Q.H.

Intensive reading of modern Spanish prose and poetry of moderate difficulty. Further practice in composition and continued conversation practice based on assigned readings.

Prof. Modee and Staff

32.209 Conversational Spanish I

(Prereq. 32.204 or equiv.; open to non-majors only) 4 Q.H.

Emphasis on developing the student's ability to speak Spanish and to comprehend it. Ordinarily, the entering student will have completed 32.204, or the equivalent, but particularly able students may be accepted after having completed only 32.202. In this case, the sequence 32.209-210 may be used to satisfy the language requirement.

Mrs. Licis

Fall and Winter Qtrs.

32.210 Conversational Spanish II

(Prereq. 32.209 or equiv.) 4 Q.H.

Continuation of 32.209, with continuing emphasis on the development of oral facility in Spanish.

Mrs. Licis

Spring and Summer Qtrs.

32.211 Advanced Conversational Spanish

(Prereq. 32.210 or equiv.; open to non-majors only) 4 Q.H.

Continuation and more intensive practice of work begun in 32.210.

Mrs. Licis

32.213 Readings in Spanish Literature

(Prereq. 32.204 or equiv.; open to non-majors only) 4 Q.H.

The opportunity to read some of the most interesting works of Spanish literature without the intensive survey required in the Masterpieces course. Conducted in English.

Mrs. Jolliff

Fall and Winter Qtrs.

32.214 Readings in Latin American Literature

(Prereq. 32.204 or equiv.) 4 Q.H.

Companion course to 32.213. Emphasis upon the literature of Latin America. Conducted in English.

Mrs. Jolliff

Spring and Summer Qtrs.

32.215 Backgrounds in Hispanic Culture I

4 Q.H.

Open to all interested students. A reading knowledge of Spanish is helpful, but *not* essential. This course provides a multimedia survey of Spanish culture: slides, concerts, films, field trips, and guest lecturers utilized. Language majors should consult with the instructor concerning possible major credit. Conducted in English.

Prof. Kitchin

Fall and Winter Qtrs.

32.216 Backgrounds in Hispanic Culture II

(Prereq. 32.204 or equiv.) 4 Q.H.

Reading knowledge of Spanish required. This course begins with a survey of the three most important pre-Colombian cultures (Incas, Mayas, and Aztecs). Subsequently, the focus is on intellectual history of Latin America. Readings include *Carta de Jamaica* and *Discurso ante el Congreso de Angostura*.

Miss Lopez

Spring and Summer Qtrs.

32.227 Spanish Composition and Conversation I

(Prereq. 32.204 or equiv.) 4 Q.H.

Practice in writing and speaking Spanish, including written and oral resumes, prepared speeches and themes, impromptu speaking and writing. A review of the more subtle problems of grammar.

Prof. Jaramillo and Staff

Fall and Winter Qtrs.

32.228 Spanish Composition and Conversation II

(Prereq. 32.227 or equiv.) 4 Q.H.

Further practice in oral and written Spanish; continued study of problems of advanced Spanish grammar.

Prof. Jaramillo and Staff

Spring and Summer Qtrs.

32.229 Advanced Spanish Proficiency I

(Prereq. consent of instructor) 4 Q.H.

Designed for those preparing to enter the teaching profession, as well as qualified advanced students. Advanced elements of Spanish syntax, with emphasis upon achieving superior speaking, reading, and writing skills.

Prof. Jaramillo

Offered 1974-75

32.230 Advanced Spanish Proficiency II

(Prereq. 32.229 and consent of instructor) 4 Q.H.

Continuation of aims and goals of 32.229.

Prof. Jaramillo

Offered 1974-75

32.231 Masterpieces of Spanish Literature I

(Prereq. 32.204 or equiv.); 4 Q.H.

Introductory course in Spanish literature. Selected works from the Middle Ages to the *Siglo de Oro*.

Mrs. Wegmann

Fall and Winter Qtrs.

32.232 Masterpieces of Spanish Literature II

(Prereq. 32.204 or equiv.) 4 Q.H.

Introductory course in Spanish literature. Selected works from the 19th and 20th centuries.

Mrs. Wegmann

Spring and Summer Qtrs.

32.239 Spanish Literature of the Middle Ages

(Prereq. 32.232 or equiv.) 4 Q.H.

Selections from the major works of the Middle Ages, from the *Poema del Cid* to the *Libro de buen amor*.

Prof. Modee

Offered 1974-75

32.241 Spanish Literature of the 15th and 16th Centuries

(Prereq. 32.232 or equiv.) 4 Q.H.

Selections from the major works of the 15th and 16th centuries, from *La Celestina* to mysticism.

Prof. Modee

Offered 1974-75

32.243 Spanish Literature of the Golden Age

(Prereq. 32.232 or equiv.) 4 Q.H.

Cervantes; selections from the *Entremeses*, the *Novelas ejemplares*, and *Don Quijote*, with emphasis on the latter as Spain's greatest literary masterpiece.

Prof. Kitchin

Fall and Winter Qtrs.

32.244 Spanish Literature of the Golden Age

(Prereq. 32.232 or equiv.) 4 Q.H.

Readings from the *comedias* of Lope de Vega, Tirso de Molina, Galderon, and Ruiz de Alarcon; also prose and poetry selections from Gongora and Quevedo.

Prof. Kitchin

Spring and Summer Qtrs.

32.247 Spanish Literature of the 19th Century

(Prereq. 32.232 or equiv.) 4 Q.H.)

Readings in the prose, poetry, and drama of the romantic period, including selections from el Duque de Rivas, Larra, Espronceda, Zorrilla, and Becquer.

Prof. Modee

Fall and Winter Qtrs.

- 32.248 Spanish Literature of the 19th Century** (Prereq. 32.232 or equiv.) 4 Q.H.
A study of some of the major novelists of the second half of the 19th century.
Prof. Modee Spring and Summer Qtrs.
- 32.249 Spanish Literature of the 20th Century** (Prereq. 32.232 or equiv.) 4 Q.H.
Selections from the writings of the Generation of '98: Unamuno, Valle-Inclan, Pio Baroja, Benavente, Azorin, and the Machado brothers.
Prof. Jaramillo Offered 1974-75
- 32.250 Spanish Literature of the 20th Century** (Prereq. 32.232 or equiv.) 4 Q.H.
Prose and poetry of modern writers, such as Ortega y Gasset, Perez de Ayala, Garcia Lorca, Juan Ramon Jimenez, Gironella, and Jose Cela.
Prof. Jaramillo Offered 1974-75
- 32.251 Latin American Literature** (Prereq. 32.232 or equiv.) 4 Q.H.
Early Latin American literature; the literature of the colonial period and the early 19th century based primarily on selections from an anthology.
Prof. Jaramillo Fall and Winter Qtrs.
- 32.252 Latin American Literature** (Prereq. 32.232, equiv.) 4 Q.H.
Modern Latin American literature; readings from 19th- and 20th-century prose and poetry.
Prof. Jaramillo Spring and Summer Qtrs.
- 32.291, 32.292, 32.293, 32.294 Directed Study** 4 Q.H. (each)
Staff All Quarters
- 32.295, 32.296, 32.297, 32.298 Honors Program** 4 Q.H. (each)
Staff All Quarters

German

Prerequisites listed for Modern Languages are based on current course numbers at Northeastern. Equivalent course work done elsewhere will be considered acceptable to satisfy these prerequisites.

- 33.201 Elementary German I** 4 Q.H.
Essentials of grammar, practice in pronunciation, acquisition of a basic vocabulary, idiomatic expressions.
Prof. Cooperstein and Staff Fall and Winter Qtrs.
- 33.202 Elementary German II** (Prereq. 33.201) 4 Q.H.
More difficult points of grammar; reading of simple German prose, with oral and written exercises.
Prof. Cooperstein and Staff
- 33.203 Intermediate German I** (Pereq. 33.202) 4 Q. H.
Reading practice, using texts of average difficulty; review of grammar; written and oral exercises.
Prof. Aluf and Staff
- 33.204 Intermediate German II** (Prereq. 33.203) 4 Q.H.
Readings from modern German prose; practice in speaking and writing.
Prof. Aluf and Staff

- 33.205 Reading German in the Arts and Sciences** 4 Q.H.
A one-quarter course designed to give students sufficient knowledge of German grammar and sentence structure to enable them to translate critical and scientific texts with the aid of a dictionary. Students do not learn to speak or write German; instead, class time is devoted to the acquisition of the grammar necessary for translation, as well as to practice in translating texts from various scientific and humanistic fields. May *not* be used to fulfill a language requirement.
Prof. Andrea Fall and Winter Qtrs.

33.207 Scientific German (Prereq. 33.204, 33.205, or equiv.) 4 Q.H.
Review of grammar and syntax; advanced readings in expository German. Articles dealing with chemistry, physics, mathematics, biology, and other disciplines in the arts and sciences, in keeping with the students' major fields.
Prof. Aluf

Spring and Summer Qtrs.

33.217 German Literature in Translation I 4 Q.H.
Elective open to all students. Offers a study of some of the most significant works of German literature in translation. Topics vary from year to year. Language majors receive major credit for this course *only* by making special arrangements with the instructor for extra work to be done. Conducted in English.
Prof. Andrea

Fall and Winter Qtrs.

33.218 German Literature in Translation II 4 Q.H.
Companion course to 33.217. Readings center around the theme of "The Search for Identity". Novels and plays by such 20th-century German authors as Mann, Rilke, Frisch, and Durrenmatt are read.
Prof. Andrea

Spring and Summer Qtrs.

33.227 German Composition and Conversation I (Prereq. 33.204) 4 Q.H.
Aimed at developing writing and speaking ability. Some grammar review and weekly compositions; prepared and impromptu speaking on a variety of topics dealing with everyday German Life.
Miss Boehme

Fall and Winter Qtrs.

33.228 German Composition and Conversation II (Prereq. 33.227) 4 Q.H.
A continuation of 33.227.
Miss Boehme

Spring and Summer Qtrs.

33.231 Masterpieces of German Literature I (Prereq. 33.204 or equiv.) 4 Q.H.
Readings of 20th-century works accompanied by selections from major writers extending from the *Hildebrandslied* to Luther.
Miss Boehme

Fall and Winter Qtrs.

33.232 Masterpieces of German Literature II (Prereq. 33.204 or equiv.) 4 Q.H.
Readings of 19th-century works accompanied by selections from major writers from Luther to the present.
Miss Boehme

Spring and Summer Qtrs.

33.245 Classical Period of German Literature (Prereq. 33.232 or equiv.) 4 Q.H.
Background and general survey of the period from 1750 to 1800, with particular emphasis on the works of Lessing and Schiller.
Prof. Cooperstein

Offered 1974-75

33.246 The Works of Goethe (Prereq. 33.232 or equiv.) 4 Q.H.
Dramas, prose writings, and lyric poetry of Goethe. Lectures, collateral readings, reports.
Prof. Cooperstein

Offered 1974-75

33.247 German Literature of the 19th Century (Prereq. 33.232 or equiv.) 4 Q.H.
Background and general survey of German literature in the 19th century, with particular attention to prose and lyric poetry.
Prof. Cooperstein

Offered 1975-76

33.248 German Drama of the 19th Century (Prereq. 33.232 or equiv.) 4 Q.H.
Plays by Kleist, Hebbel, Grillparzer, and Ludwig. Lectures, collateral readings, reports.
Prof. Cooperstein

Offered 1975-76

33.249 German Literature of the 20th Century (Prereq. 33.232 or equiv.) 4 Q.H.
Recent German literature, particularly prose and lyric poetry.
Prof. Cooperstein

Fall and Winter Qtrs.

33.250 German Drama of the 20th Century (Prereq. 33.232 or equiv.) 4 Q.H.
Plays by Schnitzler, Hofmannsthal, Wedekind, Kaiser, Toller, Unruh, and Weichert.
Prof. Cooperstein

Spring and Summer Qtrs.

- 33.251 The German Lyric** (Prereq. 33.204 or equiv.) 4 Q.H.
 German lyric poetry from the 12th century to the present. Analysis of selected poems, reports, discussions.
 Prof. Aluf Fall and Winter Qtrs.
- 33.291, 33.292, 33.293, 33.294 Directed Study** 4 Q.H. (each)
 Staff All Quarters
- 33.295, 33.296, 33.297, 33.298 Honors Program** 4 Q.H. (each)
 Staff All Quarters

Russian

Prerequisites listed for Modern Languages are based on current course numbers at Northeastern. Equivalent course work done elsewhere will be considered acceptable to satisfy these prerequisites.

- 34.201 Elementary Russian I** 4 Q.H.
 Essentials of grammar, practice in pronunciation, progressive acquisition of a basic vocabulary, idiomatic expressions.
 Staff Fall and Winter Qtrs.
- 34.202 Elementary Russian II** (Prereq. 34.201) 4 Q.H.
 Continuation of grammar study; oral and written exercises.
 Staff Spring and Summer Qtrs.
- 34.203 Intermediate Russian I** (Prereq. 34.202) 4 Q.H.
 Designed to further the student's knowledge of Russian through oral and written work; the study of grammar and reading in texts of moderate difficulty.
 Staff Fall and Winter Qtrs.
- 34.204 Intermediate Russian II** (Prereq. 34.203) 4 Q.H.
 Continuation of work and aims of 34.203.
 Staff Spring and Summer Qtrs.
- 34.207 Scientific Russian** (Prereq. 34.204 or equiv.) 4 Q.H.
 Readings of Russian texts in mathematics, physics, chemistry, astronomy, biology, and medical science. Designed to prepare the student for the departmental reading examination he may wish to take in his chosen field. As far as possible, texts are selected on the basis of the students' needs and interests.
 Prof. Spiegel Not offered 1973-74
- 34.215 Backgrounds of Russian Culture** 4 Q.H.
 Conducted in English. Designed to give the student a view of all aspects of Russian culture and civilization. The course utilizes guest speakers, films, field trips, and discussions in its presentation. Language majors should consult with the instructor concerning possible major credit.
 Prof. Spiegel Fall and Winter Qtrs.
- 34.217 The Works of Alexander Pushkin in English Translation** 4 Q.H.
 A survey and analysis in English of Alexander Pushkin's artistic prose, his lyric, his correspondence, and *Eugen Onegin* (his novel in verse). Some attention is devoted to the story of his life, literary friendships, and major literary influences. Language majors should consult with the instructor concerning possible major credit.
 Prof. Spiegel Spring and Summer Qtrs.
- 34.227 Russian Composition and Conversation I** (Prereq. 34.204) 4 Q.H.
 Designed to develop skills in speaking and writing of colloquial Soviet usage of the Russian language. Classroom work is supplemented with tapes.
 Mr. Ford Fall and Winter Qtrs.

34.228 Russian Composition and Conversation II	(Prereq. 34.227) 4 Q.H.
A continuation of 34.227.	
Mr. Ford	Spring and Summer Qtrs.
34.247 Russian Short Story of the 19th Century	(Prereq. 34.204) 4 Q.H.
Detailed analysis of selected short stories of the 19th century read in Russian; study of the development of the genre.	
Staff	Fall and Winter Qtrs.
34.248 Russian Drama of the 19th Century	(Prereq. 34.204) 4 Q.H.
Detailed analysis of selected representative plays read in Russian; study of the development of this genre.	
Staff	Spring and Summer Qtrs.
34.251 Russian Expository Prose	(Prereq. 34.204) 4 Q.H.
Selected readings of lectures, speeches, essays, and critical studies by outstanding Russian scholars.	
Staff	Not offered 1973-74
34.253 Russian Folklore	(Prereq. 34.204) 4 Q.H.
Various genres of Russian folk literature read in Russian. Readings are supplemented with lectures and tape recordings.	
Staff	Not offered 1973-74
34.254 Russian Poetry	(Prereq. 34.204) 4 Q.H.
The major works of important classical and modern poets read in Russian and analyzed.	
Staff	Not offered 1973-74
34.255 Pushkin's Artistic Prose	(Prereq. consent of instructor) 4 Q.H.
Reading of Pushkin's major prose fiction in the original, accompanied by stylistic and structural analyses. Background materials and articles of criticism are consulted. Individual oral presentations by students (in English)) and research papers (in English) by arrangement with instructor.	
Prof. Spiegel	Not offered 1973-74
34.256 Pushkin's Narrative Poetry	(Prereq. consent of instructor) 4 Q.H.
Reading of Pushkin's narrative poems in the original, accompanied by the study of the author's poetic techniques and devices. The evolution of this genre is examined in the light of literary trends, influences, and controversies. Research papers on selected topics in English.	
Prof. Spiegel	Not offered 1973-74
34.291, 34.292, 34.293, 34.294 Directed Study	4 Q.H. (each)
Staff	All Quarters
34.295,34.296,34.297,34.298 Honors Program	4 Q.H. (each)
Staff	All Quarters

Italian

Prerequisites listed for Modern Languages are based on current course numbers at Northeastern. Equivalent course work done elsewhere will be considered acceptable to satisfy these prerequisites.

35.201 Elementary Italian I	4 Q.H.
Essentials of grammar, practice in speaking and reading, progressive acquisition of basic language skills.	
Staff	Fall and Winter Qtrs.
35.202 Elementary Italian II	(Prereq. 35.201) 4 Q.H.
Continuation of grammar study and basic language skills. Reading of Italian of increasing	

difficulty; practice in conversation.

Staff

Spring and Summer Qtrs.

35.203 Intermediate Italian I

(Prereq. 35.202) 4 Q.H.

Continuation of grammar. Oral practice and the reading of selected texts.

Staff

Fall and Winter Qtrs.

35.204 Intermediate Italian II

(Prereq. 35.203) 4 Q.H.

Continuation of 35.203, with greater emphasis on reading.

Staff

Spring and Summer Qtrs.

35.227 Italian Composition and Conversation I

(Prereq. 35.204) 4 Q.H.

Aims at perfect speaking and writing ability. The basis of work is analysis of the language, oral and written reports, and general discussions. Conducted in Italian.

Prof. Fabrizi

Fall and Winter Qtrs.

35.228 Italian Composition and Conversation II

(Prereq. 35.227) 4 Q.H.

Continuation of 35.227, with stress on individual work, free discussions, and compositions. Conducted in Italian.

Prof. Fabrizi

Spring and Summer Qtrs.

35.231 Masterpieces of Italian Literature I

(Prereq. 35.204) 4 Q.H.

Introductory course in Italian literature. Selected works from the *Trecento* to the 18th century.

Prof. Fabrizi

Fall and Winter Qtrs.

35.232 Masterpieces of Italian Literature II

(Prereq. 35.204) 4 Q.H.

Introductory course in Italian literature. Selected works from the 19th and 20th centuries.

Prof. Fabrizi

Spring and Summer Qtrs.

35.291, 35.292, 35.293, 35.294 Directed Study

4 Q.H. (each)

Staff

All Quarters

35.295, 35.296, 35.297, 35.298 Honors Program

4 Q.H.

Staff

All Quarters

Latin

36.201 Elementary Latin I

4 Q.H.

The essentials of Latin grammar, with progressive acquisition of skill in reading and translation of simple texts.

Ms. Landesman

Fall and Winter Qtrs.

36.202 Elementary Latin II

(Prereq. 36.201) 4 Q.H.

Continuation of 36.201. Additional grammar study and reading practice.

Ms. Landesman

Spring and Summer Qtrs.

Journalism

38.101 History and Principles of Journalism

4 Q.H.

Development of American journalism from European and English beginnings. The problems and contributions of the "Colonial Press", the Revolutionary War period, the "Party Press", the "Penny Press", and the leading contributions to early American journalism. The evolution of freedom of the press and the concurrent responsibility of the press media. Some writing required.

Prof. Speers

Fall and Winter Qtrs.

38.102 History and Principles of Journalism

4 Q.H.

A continuation of 38.101 from mid-19th century. America's great personal journalists and mass circulation "giants" and their contributions: Greeley, Bennett, Raymond, Dana, Grady,

Nelson, Ochs, White, Medill, Pulitzer, Hearst, Scripps, Howard, McCormick, and others. The relationships of journalism to such events as the Civil War, the Spanish-American War; the unfolding principles. Some writing required.

Prof. Speers

Spring Qtr.

38.103 Fundamentals of Newswriting

4 Q.H.

Functions of the editorial department and procedures in obtaining and writing news stories. Extensive practice in writing news stories.

Mrs. Ackerman and Mr. Pothier

Fall and Winter Qtrs.

38.104 Fundamentals of Newswriting

(Prereq. 38.103 or consent of instructor) 4 Q.H.

Problems of reporting and news writing with written assignments in various types of spot news reporting.

Mrs. Ackerman and Mr. Pothier

Spring and Summer Qtrs.

38.105 Techniques of Journalism

(Prereq. 38.104 or consent of instructor) 4 Q.H.

Advanced practice in writing news stories along with editorials, feature stories, criticisms and other assignments.

Mrs. Ackerman and Mr. Pothier

Fall and Winter Qtrs.

38.106 Techniques of Journalism

(Prereq. 38.105 or consent of instructor) 4 Q.H.

Editing the news, with practice in copy editing, headline writing, and newspaper makeup.

Mrs. Ackerman and Mr. Pothier

Spring and Summer Qtrs.

38.107 The Press and Society

4 Q.H.

The relationships of the press media to American society; the various roles of the press; the unfolding legislative pattern before and after the First Amendment; some outstanding court cases concerning the press: i.e., contempt of court, licensing, taxing the press; relationships between the press and the U.S. Post Office. A study project, involving work with professional newspapers, is required.

Prof. Speers

Fall and Winter Qtrs.

38.108 The Press and Society

4 Q.H.

Some of the major legal considerations concerning the press media, such as libel and slander; right of privacy; the public's "right to know"; some current and past restrictive legislation. A study project involving work with professional newspapers, is required.

Prof. Speers

Spring Qtr.

38.121 Television Newswriting

4 Q.H.

Techniques of writing for television news as opposed to writing for other news media. The marriage of script to various video outputs; importance of the writer-reporter in both his roles as a field-producer and a writer-producer; terms and language used in the production of TV news shows. Actual individual production of student news shows; field trips to TV stations; guest lecturers from the TV news media.

38.130 Advanced Reporting

4 Q.H.

All over the country increasing numbers of special teams are being utilized to handle investigative reporting. This course covers the daily press, but also delves into the techniques used by radio-TV, the underground press, wire services, suburban weeklies, and magazines. Students participate in a selected controversial project and produce a series for publication and broadcast.

38.135 Public Affairs and Journalism

4 Q.H.

A series of seminars featuring well-known professionals from major newspapers, radio-TV stations, wire services, magazines, photography, and public relations. An up-to-date, in-depth explanation of techniques and theories utilized in various media. Instructors include many award winners and even Pulitzer Prize recipients. Sponsored by the New England Chapter of Sigma Delta Chi, the professional journalism organization, to benefit its journalism scholarship program at the University.

38.190 Directed Study in Journalism

(Prereq. consent of instructor) 4 Q.H.

Fall, Winter, and Spring Qtrs.

Economics

Unless otherwise stated, a prerequisite for all advanced economics courses is two quarters of a basic economics course, such as 39.105 and 39.106, or 39.115 and 39.116, or 39.125 and 39.126. Exceptions to this prerequisite made at the discretion of the instructor.

39.105 Principles of Economics

4 Q.H.

Development of macroeconomic analysis; review of national income concepts; national income determination, fluctuation, and growth; role of the banking system and the Federal Reserve System; government expenditures and taxation; international trade; balance of international payments.

Staff

Fall and Winter Qtrs.

39.106 Principles of Economics

4 Q.H.

The role of a market pricing system, demand and supply, in determining the allocation of resources to competing uses and why this system may not function adequately in certain areas. Application of economic principles to private and public problems in such areas as pollution, poverty, and racial discrimination.

Staff

Spring and Summer Qtrs.

39.115 Principles and Problems of Economics

4 Q.H.

An introduction to the conceptual aspects of economics; the flow of national income; economic growth and fluctuation; the role of money and banking; monetary and fiscal policies. Emphasis on developing conceptual tools for use in the analysis of economic problems facing modern society.

Staff

Fall and Winter Qtrs.

39.116 Principles and Problems of Economics

4 Q.H.

Development of basic theory of demand, supply, and market price. Applications to selected microeconomic problems, such as basic economics of monopoly and competition, poverty, race and discrimination, urban affairs, pollution, and other problems which relate to the role of the pricing system in resource allocation and income distribution.

Staff

Spring and Summer Qtrs.

39.125 Economics

4 Q.H.

Macroeconomic problems, theory and policy; basic economic concepts and the institutional setting of the American economic system, its goals and problems; national income and product definition and measurement; the theory of income determination; the relation between prices and money; the mechanics of commercial banking operations, central banking, and monetary policy; government and fiscal policy; appraisal of stabilization policies; economic growth theory and problems.

Prof. Herman

Fall and Winter Qtrs.

39.126 Economics

4 Q.H.

Explanation of elements of demand, supply and cost, market pricing, and allocation of resources. Application of market theory to selected current areas of concern: pollution, poverty, racial discrimination, urban problems, monopoly and competition, etc.

Prof. Herman

Spring and Summer Qtrs.

39.190, 39.191 Directed Study

4 Q.H.

Independent work under the direction of member of the Department on a chosen topic. Limited to qualified seniors majoring in Economics, with approval of Department.

Staff

39.250 Statistics I

4 Q.H.

Elementary set theory, basic probability, Bayesian decision making, measurement and presentation of economic statistics, descriptive statistics, basic estimation techniques, applications.

Staff

Fall and Winter Qtrs.

39.251 Statistics II

(Prereq. 39.250) 4 Q.H.

Testing statistical hypotheses, sampling problems; analysis of variance; correlation and

linear regression analysis.

Staff

Spring and Summer Qtrs.

39.255 Microeconomic Theory

4 Q.H.

A detailed study of supply and demand analysis, various elasticity concepts and applications, theory of consumer demand, theory of production, derivation of cost curves. Detailed analysis of pricing and output behavior in the several market structures with their welfare implication; the pricing of resources.

Staff

Fall and Winter Qtrs.

39.256 Macroeconomic Theory

4 Q.H.

Investigation of the conceptual and empirical problems of creating and using national accounts; price index problems; conceptual and empirical evaluation of several consumption and investment functions, and their policy implications; multiplier and accelerator models; a brief history of recent cyclical fluctuations. Theories of inflation and growth are analyzed in the light of recent economic history.

Prof. Shelby

Spring and Summer Qtrs.

39.259 European Economic Development

4 Q.H.

Economic inheritance of the 19th-century development of capitalism and laissez-faire. The aftermath of the Industrial Revolution, European overseas expansion, the 20th century, the world wars, the dissolution of empires, American economic conquest and European integration, the future of less developed areas in southern Europe. Environmental impact of industrialism and the implications of technological society.

Prof. Schachter

Fall Qtr.

39.260 American Economic Development

4 Q.H.

Economic development of the U.S. from the colonial period to the present; historical changes in available factors; economic institutions and technologies; special attention to preconditions of industrialism. The American Industrial Revolution, its spread and socioeconomic consequences. The Great Depression and the subsequent rise of mixed economy and welfare state; U.S. adjustments to postwar economic changes.

Prof. Shelby

Spring Qtr.

39.261 Economic History of Less-Developed Countries

4 Q.H.

The problems of initiating and sustaining growth in selected third-world countries during the past 200 years, with emphasis on traditional vs. contemporary economic development. Role of Western society; impact of technological and structural changes; relations between states and economic enterprises.

Staff

Winter Qtr.

39.265 Money and Banking

(Prereq. only 39.105, 39.115 or 39.125) 4 Q.H.

The nature and function of money, credit, and monetary standards, and the role of our monetary and banking system in the economy. Topics include: commercial banking, monetary theory and policy, the role and instruments of the Federal Reserve System, and international monetary problems.

Prof. Caligaris

Spring and Summer Qtrs.

39.266 Government Finance

4 Q.H.

Fiscal functions, institutions, and politics; growth of the public sector; expenditure planning in theory and practice; cost-benefit analysis; principles of taxation and tax incidence; major taxes at Federal and state-local levels; fiscal policy for high employment, price stability, and growth; current fiscal problems such as tax reform, urban fiscal problems, fiscal federalism, and income maintenance programs.

Prof. Musgrave

Fall and Winter Qtrs.

39.267 Economics of Urban Transportation

4 Q.H.

Transportation and land-use patterns; externalities; social costs and social benefits of various modes of urban transportation; ownership, regulations, and financing of various modes of

transportation; economies of new technology in urban transportation.
Staff

Winter Qtr.

39.268 Urban Economics

4 Q.H.

An inquiry into the causes of the location and the growth of urban centers; economic analysis of selected urban problems.

Prof. Brown

Fall and Winter Qtrs.

39.269 Urban Economic Problems and Policies

4 Q.H.

Sequel to Urban Economics. Detailed analysis of urban problems, such as housing, transportation, land use, public services. Exploration of public policies related to such problems.

Prof. Brown

Spring and Summer Qtrs.

39.271 Social Control of Economic Activities

4 Q.H.

Historical development of the government's role in economic affairs. The relationships between the government and industry, labor, agriculture, public utilities, consumers; economy in general; antitrust laws and their effects on market structure and performance; theoretical analysis of interaction of various sectors of the economy.

Prof. Horowitz

Fall and Winter Qtrs.

39.273 Industrial Organization and Public Policy

(Prereq. 39.255) 4 Q.H.

The theoretical framework for analysis and evaluation of the static and dynamic performance of real markets. An examination of the empirical studies testing the usefulness of applying theory to real markets. An examination of antitrust as a public policy designed to promote better market performances.

Staff

Spring Qtr.

39.275 Labor Economics

4 Q.H.

Examination of the economics of the labor market and the labor force and of the institutions and policies dealing with them; employment, unemployment, wage determination, income distribution, and the development and efficient use of labor resources; development of trade unions; collective bargaining issues and their economic consequences.

Prof. Herrnsstadt

Winter and Spring Qtrs.

39.277 Economics of the Quality of Urban Environment and Control

4 Q.H.

Economic analysis of air, water, thermal, and noise pollution; the utilization of urban space and other urban resources; identification of possible economic effects of urban environment, such as crime, delinquency, immobility, and congestion.

Prof. Swanson

Fall and Winter Qtrs.

39.278 Poverty and Discrimination

4 Q.H.

Dimensions of poverty in America; the economics of race and racism. Analysis of other contributors to income and wealth inequities: age, education, and sex discrimination; domestic and world poverty.

Prof. Kidder

Fall and Winter Qtrs.

39.279 Manpower and Anti-Poverty Policies and Programs

4 Q.H.

Sequel to 39.278, Poverty and Discrimination; assessment of government and private efforts to fight poverty and improve the labor market position of impoverished groups; relationship between causes of poverty and discrimination; and possible remedies. Manpower training programs, negative income tax, family allowances, and other income maintenance schemes.

Prof. Herrnsstadt

Spring and Summer Qtrs.

39.280 Comparative Economics

4 Q.H.

Competing types of theoretical economic systems; analysis of organization and operation of currently existing types of communist, socialist, and capitalist economies; comparison and evaluation of economic behavior and performance of different economic systems.

Profs. Shelby and Schacter

Spring and Summer Qtrs.

39.281 Introduction to Mathematical Economics

(Prereq. 10.105; calculus not required) 4 Q.H.

Functional analysis, matrix algebra, analysis of statistical economics models, derivatives, and differentiation and optimization.

Staff Fall and Winter Qtrs.

39.282 Mathematical Economics

(Prereq. 39.281 or consent of instructor) 4 Q.H.

For economics, mathematics, business, and engineering students interested in a broad coverage of economic analysis using mathematical techniques as tools. Topics are: models of the firm, demand theory, input-output, and other planning and policy models of the national economy.

Staff Spring Qtr.

39.285 Economic Development

4 Q.H.

Prospects for economic growth in poor nations as indicated by economic analysis and historical experience; social, cultural, and institutional determinants of growth; implications for the international position and policies of the U.S.

Prof. Schachter Fall and Winter Qtrs.

39.286 International Economics

4 Q.H.

Introduction to the theory of international trade and its role in resource allocation; implications of economic welfare; foreign exchange; the balance of payments mechanism; and problems of disequilibrium and adjustment.

Prof. Lapan Spring Qtr.

39.288 Economic Growth and Instability

4 Q.H.

Measurement and cost of economic growth and instability; long-run models and explanations of aggregate growth; short-run models and causes of fluctuations in output, employment, and prices; long-run projections and short-run forecasts of aggregate change; policies for optimal growth and stability.

Prof. Shelby Fall and Winter Qtrs.

39.289 Advanced Economic Theory

(Prereq. 39.255 and 39.256) 4 Q.H.

Advanced theoretical treatment of selected topics in microeconomics and macroeconomics. Recommended for students planning to take graduate economics.

Staff Spring Qtr.

39.291 Senior Economic Seminar

(Prereq. 39.255 and 39.256) 4 Q.H.

Course for senior Economics majors; coordinating and applying economic concepts, methodology, and data to contemporary issues and problems of broad social, economic, and philosophical importance.

Prof. DeCicco Spring Qtr.

39.292 History of Economic Thought

4 Q.H.

Comprehensive course of study in the development of economic thought. Coverage includes mercantilism as the first economic doctrine; analysis of older classical school, its later refinements (modern marginalism), and its important critics (socialists, Marxists); Keynesian and modern developments.

Prof. DeCicco Spring Qtr.

39.293 Introduction to Econometrics

(Prereq. 39.251) 4 Q.H.

The methods of econometric estimation and forecasting. Coverage includes topics in various statistical techniques. Students are given the opportunity to construct their own models and use computer facilities for estimation and forecasting.

Staff Spring Qtr.

39.294 Problems in Economic Research

4 Q.H.

Research methods of practicing economists with typical problems from applied areas of economics and choice of modeling framework; problems of data collection, review of estimation techniques and interpretation of results; development of static and dynamic adaptive policy models.

Staff Spring Qtr.

39.295, 39.296, 39.297, 39.298 Honors Program
Prof. DeCicco

(each) 4 Q.H.
All Quarters

Accounting

41.111 Accounting Principles I

4 Q.H.

An exploration of the relationship between business activity and accounting, with focus on the nature and purpose of accounting; the uses of management accounting data and reports.

Staff

Fall and Winter Qtrs.

41.112 Accounting Principles II

(Prereq. 41.111) 4 Cl.; 4 Q.H.

Emphasizes financial reporting, measuring and appraising the financial results of business operations, and accounting for business assets.

Staff

Spring Qtr.

41.201 Introduction to Accounting—I.E.

4 Q.H.

To acquaint Engineering students with the basic purposes, principles, and practices of financial accounting; to discuss cost patterns and measurements in terms of their limits and usefulness; and to familiarize students with managerial accounting, including such topics as break-even analysis, budgets, standard costs, and capital budgets.

Staff

Fall and Winter Qtrs.

41.205 Cost Accounting for Management

(Prereq. 41.112) 4 Q.H.

An examination of cost accounting from a managerial viewpoint. The impact of quantitative and behavioral aspects on budgets and cost control is stressed.

Prof. Grossman and Staff

All Quarters

41.207 Analysis of Financial Statements

(Prereq. 41.112) 4 Q.H.

Preparation of accounting statements; uses of ratios and analytical statements; composition of statements and statement classification; fund and cash flow analysis.

Prof. Malchman

Not Offered 1973-74

41.210 Introduction to Accounting - L.A. (Formerly Accounting Principles)

4 Q.H.

For Liberal Arts undergraduates. A survey of the foundations of accounting and the role accounting plays in the management of the profit and non-profit sectors of the American economy.

Staff

Spring and Summer Qtrs.

41.213 Survey of Federal Taxes

(Prereq. 41.112) 4 Q.H.

Intended for the student who *has not majored in Accounting* but who desires to gain a basic appreciation and understanding of the Federal tax structure rather than detailed knowledge. A survey of Federal taxation as it applies to individuals, partnerships, corporations, gifts, estates, trusts, and business decisions.

Prof. Malchman

Spring and Summer Qtrs.

41.251 Intermediate Accounting

(Prereq. 41.112) 4 Q.H.

Emphasis on accounting theory and concepts, together with an analysis of the special problems that arise in applying these concepts to financial accounting. Areas discussed are: the basic accounting process, cash receivables, liabilities, and inventory valuation.

Prof. Slavin

Fall and Winter Qtrs.

41.252 Intermediate Accounting

(Prereq. 41.251) 4 Q.H.

Continuation of the discussion of the structure of accounting theory and its underlying issues, together with an evaluation of the conflicts and shortcomings in accounting concepts. Areas discussed are investment in productive resources and accounting for corporations.

Prof. Slavin

Spring and Summer Qtrs.

41.253 Cost Accounting I

(Prereq. 41.112) 4 Q.H.

The accumulation of cost data for managerial analysis and control; familiarization with product costing systems and their usefulness.

Prof. Curran

Fall and Winter Qtrs.

41.254 Cost Accounting II

Budgetary planning and control, with emphasis on using cost data for decision-making.
 Prof. Curran (Prereq. 41.253) 4 Q.H.
 Spring and Summer Qtrs.

41.257 Auditing

Designed to give the Accounting major a thorough knowledge of auditing through the application of auditing principles and adherence to auditing standards; the ethics of the profession; and the significance of new and advanced audit techniques.
 Staff (Prereq. 41.252) 4 Q.H.
 Spring and Summer Qtrs.

41.260 Federal Taxes

Intended primarily to provide a comprehensive study of the Federal tax structure for the Accounting major who plans to enter the professional field of accounting. The student researches cases which introduce the various source materials on basic tax problems apart from specific changes made in the Internal Revenue Code. The course contains a thorough study of Federal taxation approaches to individuals, partnerships, and corporations.
 Prof. Malchman (Prereq. 41.112) 4 Q.H.
 Fall and Winter Qtrs.

41.262 Accounting Theory and Practice

Objectives are to examine: 1. the theory and practice of corporate financial reporting and some of the controversial areas in accounting; 2. the pronouncements and research studies of the authoritative institutions of the profession relating to the practice of accounting; 3. the textual and periodical literature on accounting theory.
 Prof. Roy (Prereq. 41.252) 4 Q.H.
 Fall and Winter Qtrs.

41.263 Accounting Planning and Control

The organization as a system, considering the informational needs for long- and short-run planning. The control mechanism in goal attainment. Includes both quantitative and behavioral aspects of planning and control.
 Profs. Lindhe, Carter, and Staff (Prereq. 41.112) 4 Q.H.
 Spring and Summer Qtrs.

41.264 Advanced Accounting Problems I

Intended for the student who is planning to enter the professional field of accounting. Included are pronouncements and recent statements by authoritative bodies, as well as discussions of the various approaches to problem solving and a review of the accounting principles involved. Among the topics are: partnerships, installment sales, consignments, home office and branch office relationships, and governmental and institutional accounting.
 Prof. Malchman (Prereq. 41.252) 4 Q.H.
 Fall and Winter Qtrs.

41.265 Management Accounting

(Prereq. 41.205, 41.253, or consent of instructor) 4 Q.H.
 Designed as an "enlarged" managerial accounting course in which accounting technique is made subordinate to a consideration of management uses of the end products of accounting analysis. Its main objective is a greater appreciation of the role of accounting in the basic management functions of planning, controlling, and decision making.

41.266 Contemporary Accounting Problems

A seminar designed to survey some of the important problem areas currently facing the accounting profession: 1. the criteria for a profession, 2. the legal and ethical responsibilities of the profession, 3. the profession's social responsibilities, and 4. the accounting and reporting requirements of the Securities and Exchange Commission and other Federal agencies.
 Prof. Roy (Prereq. 41.252) 4 Q.H.
 Spring and Summer Qtrs.

41.267 Tax Factors in Business Decisions

A survey of the role of taxes in decisions involving mergers, acquisitions, profit sharing, pension plans, contracts, costing procedures, employee compensation, and other tax-planning variables.
 Prof. Curran 4 Q.H.
 Spring and Summer Qtrs.

41.268 Appraisal of Management Enterprise

(Prereq. 41.112, 41.205 or 41.253) 4 Q.H.
 Designed to examine the usefulness of accounting data in management appraisal, the course

also discusses various approaches for accountants to provide a management appraisal which goes beyond the conventional financial statement. Topics are: management's social responsibilities, the attest function and possible extensions, behavioral aspects of using accounting data for performance evaluation, the accountant's role as a consultant, "management auditing," and "social audits."

41.269 Advanced Accounting Problems II

(Prereq. 41.252) 4 Q.H.

Intended for the student who plans to enter the professional field of accounting. The course consists of a concentrated study of three areas: 1. consolidations, 2. fiduciaries, and 3. actuarial science. Pronouncements and recent statements by authoritative bodies are discussed. Problem solving is used to demonstrate the application of accounting principles.

Prof. Malchman

Spring and Summer Qtrs.

Marketing

43.120 Introduction to Marketing

4 Q.H.

An overview of marketing and its role both within the firm and within society. Emphasis on the pervasive interrelationships among dynamic dimensions of the environment, marketing activities, consumer attitudes, and consumer behavior. Open as elective to non-CBA sophomore and upper-class students.

Staff

All Quarters

43.125 Consumer Problems of the 70s

4 Q.H.

Readings, discussions and class projects are used to examine and evaluate the responsibilities of business to society and to the consumer. Elective open to all upperclassmen.

Prof. Collazzo

Fall and Winter Qtrs.

43.223 Introduction to Advertising

4 Q.H.

An overview of advertising and its role in our society. Advertising is examined: 1. as part of marketing, 2. as a communications process and 3. as a viable social and economic force. Open to all upperclassmen.

Prof. Dufton

Fall and Winter Qtrs.

43.233 Retail Management

(Prereq. 43.120 or consent of instructor) 4 Q.H.

From a marketing management point of view, study is made of the activities and contributions of major retailing institutions, including department and specialty stores, supermarkets, and discount outlets. Upper-class elective.

Prof. Minichiello

Spring and Summer Qtrs.

43.235 Marketing Channels

(Prereq. 43.250 or consent of instructor) 4 Q.H.

Marketing structures and institutions; their evolution, functions, interrelationships, and the management of their role in the marketing process. Upper-class elective.

Prof. Verma

Every Other Year, Spring Qtr.

43.240 Marketing Research

(Prereq. 43.251 or consent of instructor) 4 Q.H.

The use of marketing research as a tool in planning and controlling marketing activities, including an introduction to the application of behavioral and quantitative concepts in the solution of marketing programs. Upper-class elective. Required for Marketing juniors.

Profs. Wiseman and Moriarty

Fall and Winter Qtrs.

43.242 Sales Management

(Prereq. 43.250) 4 Q.H.

Creation, management, and appraisal of the sales force. Case studies and discussions, plus selected readings. Junior and senior elective.

Prof. Minichiello

Every Other Year, Spring Qtr.

43.244 Quantitative Methods for Marketing Management

(Prereq. 49.251) 4 Q.H.

The contribution of quantitative techniques and the computer to decision-making in marketing and related business policy areas. Junior and senior elective.

Profs. Verma and Wiseman

Every Other Year, Spring Qtr.

43.250 Marketing Management I

(Required of Marketing majors) 4 Q.H.

An introduction to market analysis and the design and implementation of marketing

strategies. Of primary concern is the appraisal of the environment of business and marketing activities, with particular emphasis on factors affecting the nature and extent of consumer demand. An upper-class elective prerequisite to a number of other elective Marketing courses. Open to non-Marketing majors in middler, junior, and senior years.

Profs. Minichiello and Verma

Fall and Winter Qtrs.

43.251 Marketing Management II

(Prereq. 43.250) 4 Q.H.

A continuation of 43.250. Based on understanding of business and marketing environment and of consumer demand, this quarter focuses on the interrelated roles of product, price, distribution and promotion in the development and operation of marketing programs. Upper-class elective required of Marketing middlers.

Profs. Dufton and Verma

Spring and Summer Qtrs.

43.261 International Marketing

4 Q.H.

The opportunities, methods, and policies in management of international marketing programs. Upper-class elective.

Prof. Verma

Fall and Winter Qtrs.

43.262 Advertising Management

(Prereq. 43.251 or consent of instructor) 4 Q.H.

Advertising management through class discussions of case studies selected to illustrate means of achieving proper balance and coordination of advertising with other elements in the marketing mix. Junior and senior elective.

Prof. Dufton

Fall and Winter Qtrs.

43.265 Industrial Marketing

(Prereq. 43.250 or consent of instructor) 4 Q.H.

The marketing of products where business firms are the potential customers. Upper-class elective, open to juniors and seniors.

Prof. Dufton

Every Other Year, Spring Qtr.

43.270 Senior Seminar in Marketing

(Prereq. 43.251) 4 Q.H.

An in-depth study of selected topics in marketing. The subjects explored will differ each time the seminar is offered, based on the research interests of the instructor. An elective course open only to seniors.

Senior members of the Department

Spring Qtr.

43.271 New Product Development

(Prereq. 43.120) 4 Q.H.

An analysis of the problems which firms face in directing and managing their new product development activities. Open to seniors only.

Profs. McDonald and Verma

Spring Qtr.

43.275 Foundations of Consumer Behavior

(Prereq. 43.120) 4 Q.H.

Economic, behavioral, and other models of consumer behavior are examined as bases for the planning and evaluation of marketing effort. Upper-class elective.

Profs. Dufton and McDonald

Fall and Winter Qtrs.

43.277 History of Marketing Thought

(Prereq. 43.251) 4 Q.H.

An analytical survey of the evolution of marketing and marketing thought. Emphasis is on changes in the role of marketing as practiced by business firms and as viewed by society. All upperclassmen.

Prof. Collazzo

Every Other Year, Spring Qtr.

43.278 Competitive Strategy

(Prereq. 43.251) 4 Q.H.

The capstone marketing course, a required elective for seniors majoring in Marketing. The focus is upon the formulation of marketing strategy at a policy level and its implementation in a dynamic environment.

Prof. McDonald

Fall and Winter Qtrs.

Finance and Insurance

4.120 Introduction to Financial Activity

4 Q.H.

Acquaints students with the important analytical tools, habits of thought, concepts and

knowledge surrounding the management of the flow of funds within the corporation. Deals with the firm's demand for capital, sources of capital, management of assets, dividend payments, and forecasting of funds needed.

Prof. Cerullo, Willett, and Staff

All Quarters

44.144 Management of Financial Institutions

(Prereq. 44.120) 4 Q.H.

The broad range of decision-making problems faced by major financial institutions, such as commercial banks, savings and investment institutions, and finance companies when viewed as competitive, profit-seeking business entities. The course considers such topical areas as the nature and scope of the capital markets confronting these institutions, specialized problems with regard to the sources and uses of funds of the financial institutions, and strategic policy planning of financial institutions.

Prof. Fletcher

Fall and Winter Qtrs., 1973-74

44.150 Corporate Financial Management

(Prereq. 44.120) 4 Q.H.

Extends a student's grasp of theory and analytical tools and concepts which have general applicability in most profit- and nonprofit-seeking organizations through readings and case discussions. Such analysis is primarily concerned with the evaluation of expected benefits from invested capital in relation to its costs and availability. While techniques of economic appraisal are stressed, the course also aims to locate financial valuation within the overall structure of administrative decisions concerning the allocation of an organization's financial resources.

Prof. McCarthy and Staff

Fall and Winter Qtrs

44.151 Interpreting Financial Data

(Prereq. 44.120) 4 Q.H.

Development of the capacity for proper utilization of outputs of the financial accounting process for purposes of financial management, and the associated decision-making tasks. The specific objectives are fourfold: 1. an understanding of the differences between cash flows and reported profit (i.e., net income); 2. an awareness of the implications of "generally accepted accounting principles" for financial management; 3. recognition of the need for balancing attention to profitability matters with concern for balance sheet considerations (e.g., liquidity and solvency); and 4. an understanding of the auditor in achieving credibility with respect to financial data. Contemporary issues in financial reporting are examined, with the view of illuminating the basic ideas of the course.

Prof. Caplan and Staff

Fall and Winter Qtrs

44.159 Small Business Finance

(Prereq. 44.120) 4 Q.H.

Investigates the financial requirements of smaller businesses and the sources of funds open to them. Methods of financial control in the small business are covered, as well as requirements of financing institutions. The problem of obtaining adequate equity financing and equity sources is highlighted.

Prof. Hehre

Fall and Winter Qtrs., 1974-75

44.160 International Financial Management

(Prereq. 44.150) 4 Q.H.

The issues and problems encountered by the financial function of an international firm. Considers the investment and financing decisions of a firm in the context of an international or multi-country environment. Specific topics are: capital budgeting, capitalization policies, the use of Eurocurrency and Euro-bond markets, and liquidity management by the international firm.

Prof. Duckworth

Spring and Summer Qtrs., 1973-74

44.161 Financial Control Systems

4 Q.H.

The control process in the management of any organization and the role of systematic financial controls in facilitating that process. Particular attention given to the needs of financial managers as key participants in the process. The relationships between financial planning activities and financial control are examined. Other areas of emphasis in the course are: profit planning, budgeting, performance evaluation, and incentives tied to measured performance.

Prof. Caplan

Fall and Winter Qtrs., 1973-74

44.162 Risk Management

(Prereq. 44.120) 4 Q.H.

The concept of risk and the ways of dealing with it, including risk reduction, risk combination, and insurance. Considerations of cost and risk management in comparison to the risk-cost preferences of the insurer.

Prof. Hehre

Spring and Summer Qtrs., 1973-74

44.190 Investment Strategy

(Prereq. 44.120) 4 Q.H.

The objective is to present selection and valuation techniques for the purpose of constructing an investment portfolio of financial assets including common stocks and bonds. Topics covered are the evaluation of individual security risk and return characteristics and the interpretation of financial market behavior in the context of security valuation. Emphasis is placed upon ways of evaluating individual security characteristics for portfolio purposes.

To be announced

Fall and Winter Qtrs.

44.185 Management of Financial Resources

(Prereq. 44.120) 4 Q.H.

Focuses on the raising of the supply of funds and their allocation to long-term uses in order to accomplish an organization's objectives. Standard and innovative types of securities surveyed and techniques for choosing the best mix of securities developed. The processes by which funds are obtained are described. The determination of investment opportunities and systems for their evaluation are presented.

Prof. Marple

Spring and Summer Qtrs., 1974-75

44.220 Insurance and Enterprise

(Prereq. 44.120) 4 Q.H.

A broad course approach to the theory and economics of the use of life, property, and casualty insurance in enterprises. Emphasis placed on the principles underlying the selection and use of insurance as a tool to reduce risk exposure, as well as a thorough review of contract provisions, rate making, and loss adjustment.

Prof. Willett

Spring and Summer Qtrs., 1974-75

44.240 Personal Finance

(Open to Business Administration students only with consent of instructor) 4 Q.H.

The management of the total personal estate; budgeting, savings, insurance, investments, borrowing, taxes, social security, pensions, annuities, securities markets, mutual funds, and their integration.

Prof. Cerullo

All Quarters

44.255 Estate Planning

(Prereq. 44.120) 4 Q.H.

Estate planning is essential for anyone who intends to advise others in the area of financial planning or desires to accumulate funds for himself or his dependents. It is concerned both with the accumulation of capital and its preservation. The objective of financial planning is to provide essential information necessary to make intelligent decisions and a knowledge of available alternatives. Expertise in this field requires an understanding of methods of integrating life insurance into an overall financial plan; a knowledge of basic information concerning wills, trusts, gifts, etc.; methods of funding business continuation; and estate liquidity requirements.

Prof. Willett

Fall and Winter Qtrs., 1974-75

44.260 Financial Planning

(Prereq. 44.120) 4 Q.H.

A review and evaluation of the theory and practice related to forecasting business and financial operations on both the short and long run. Particular attention is paid to controlling operations within goals and plans established by management and within constraints imposed by the industry and national economy. The relationship of the business enterprise to the national economy is stressed.

Prof. Hehre

Spring and Summer Qtrs.

44.275 Money and Economic Activity

(Prereq. 44.120) 4 Q.H.

It is said: "Money is that institution which brought humanity from a primitive stage into civilization" and there is much truth in this statement. An American industrial society oriented toward general welfare and stability is also inconceivable without the help of a sound and well-organized monetary and banking system. In this spirit, the study of money and

economic activity enriches the background of any student in business and finance with valuable knowledge for becoming an enlightened manager and citizen.

Profs. Fletcher and Rugina

Spring and Summer Qtrs.

44.290 Business Ethics

4 Q.H.

The survival of the American economic system depends, to a considerable degree, on the faith which the public places in the integrity of its business leaders. Their decisions are emulated and affect the national, ethical, and economic health. Individual student participation in this course assists students in recognizing the added complexity brought to business problems by a consideration of ethics and/or responsibility and helps students to construct and solidify a personal code of ethics which they may follow in their own careers.

Prof. Willett

44.295 The Development of the Capitalistic System

4 Q.H.

Introduction to the arguments surrounding the nature and functioning of the American capitalistic system and capitalism in general. One school of thought accuses the system of being monopolistic, whereas another defends the system as being competitive. Around this argument, excerpts from the work of great economists are used to show the development of tools of analysis for a better understanding of western capitalistic society and its problems.

Prof. Rugina

Spring and Summer Qtrs., 1974-75

Management

45.112 Business Policy

(Prereq. 45.210) 4 Q.H.

Corporate strategy and its elements, including an analysis of the company, its resources and opportunities, its environment, and decision makers. Emphasis on decision making and implementation of strategy while operating a company in the context of a business simulation.

College of Business Administration Faculty

All Quarters

45.114 Social Change

(Prereq. 45.210 or consent of instructor) 4 Q.H.

Extends the student's understanding and awareness of the dynamics of group behavior by intensive experiential involvement, particularly through the use of situational scenarios in which classroom setting becomes the research learning laboratory. Selective use is made of related research on groups.

Prof. Rochwarg

Spring Qtr.

45.115 Small Group Behavior

(Prereq. 45.210 or consent of instructor) 4 Q.H.

Seminar survey of various contemporary views about the determinants, directions, and projected effects of a rapidly changing society on the behavior of individuals and groups, and such institutions as the industrial organization. This is fundamentally a reading/discussion seminar, and the class size is limited to students having a serious interest in examining a range of conceptual views on the nature of revolutionary social change in this decade, explaining its manifest signs, and projecting its implications.

Prof. Rochwarg

Spring Qtr.

45.160 Operations Planning and Control

(Prereq. 45.265) 4 Q.H.

The requirements of planning in order for an enterprise to respond to customer demand and the control functions necessary for successful operations. The development of the planning and control system, inventory planning and control, forecasting for operations planning, and operations scheduling.

Prof. Olive

Spring Qtr.

45.209 Organization Behavior I

4 Q.H.

Application of concepts from the behavioral sciences to an understanding of the behavior of people in organizational settings. Focus is on systematic approaches to understanding behavior, looking at people as individuals and as members of small groups, and determining

implications for management. Emphasis on the development of student skills in applying behavioral concepts to situational problems.

Human Resources Faculty

Fall and Winter Qtrs.

45.210 Organization Behavior II

(Prereq. 45.209) 4 Q.H.

Continuation of study of behavior of people in organizations. Initial focus is on behavior of people in two-person relations and as members of separate groups. Later focus is on the understanding of large, complex organizations and simultaneous development of student's skill in planning and achieving change.

Human Resources Faculty

Spring and Summer Qtrs.

45.212 New Venture Creation

4 Q.H.

Designed to assist students interested in small business to answer a number of important questions through a systematic analysis of their own potential for an entrepreneurial career: i.e., What is my own entrepreneurial career? What is my own entrepreneurial orientation and commitment? What managerial and behavioral skills do I need for achievement? How do I plan for my personal and entrepreneurial goals?

Profs. Olive and Timmons

Spring Qtr.

45.250 Business and Society

(Prereq. 45.210) 4 Q.H.

An analysis of developing external influences on the business organization—social, legal, economics, cultural, ethical, and technical. Examination of the corporation in its interactions with these forces. Focus on reconciling the strains generated by these societal factors and their impact on the management and decision-making process.

College of Business Administration Faculty

All Quarters

45.251 Comparative Management

4 Q.H.

The ways in which organizational structure and management processes are shaped by the mission and objectives of the organization. Examination of different types of organizations: profit-oriented business organizations, public corporations, governmental agencies, unions, schools and universities, research laboratories, police and military organizations, hospitals, trade associations, and voluntary groups.

Prof. Marshall

Fall and Winter Qtrs.

45.258 Dynamics and Practice of Superior-Subordinate Relations

(Prereq. 45.210 or consent of instructor) 4 Q.H.

Behavioral theory and concepts applied to the understanding and performance of the leadership function in organizational management. Various laboratory procedures used in conjunction with discussion sessions to highlight individual and group concepts in problem sensing, location, and exercises as key guides to understanding.

Prof. T. Anderson

Spring Qtr.

45.260 Personnel - Industrial Relations

(Prereq. 45.210) 4 Q.H.

Investigating man and his institutions in the world of work. The "actors" (i.e., business organizations, managers, workers and unions) are examined in order to ascertain the assumptions, objectives, values, and behavior of each party under constraints. Among combinations of constraints considered are: technology, market or budgetary, legal, public values, and political systems. Utilizing the interactions which occur between the actors in the system, the student studies current problem areas of personnel and industrial relations.

Profs. Hobart and Marshall

All Quarters

45.261 Interpersonal Relations

(Prereq. 45.210 or consent of instructor) 4 Q.H.

An intensive inquiry into the communication from one person to another— the longest distance of all. Makes use of unconventional media for learning: selected films, drama, and the short story, in which universal qualities of the interactions between people are described, analyzed, and reinterpreted in different settings in today's world.

Profs. Rochwarg and Walker

Spring Qtr.

45.262 Collective Bargaining by Professional Associations

4 Q.H.

In recent years professional employers have become more numerous. They, in turn, have

made the management of organizations more complex by introducing into the employment relationship the issue of professional self-determination of goals and responsibilities. Within professional associations such as engineering, teaching, nursing, and medicine, new structures have been formed for purposes of collective bargaining, as well as for more traditional economic reasons of salaries and working conditions. The purpose of the course is to compare these different structures and to evaluate the impact of important social factors. These factors include: the development and present status of the profession, its level of autonomy, its self-image, and the market demand for its services. Case analyses, reading, guest lecturers, and independent research are utilized.

Prof. Hobart

Spring Qtr.

45.263 Career Planning and Managerial Skill Assessment

(Consent of instructor (Prereq. 45.209, 45.210) 4 Q.H.

Effective career planning and development can be viewed most profitably in the larger context of an individual's actualization process in life. On the one hand, the student explores his career with reference to personal values, interests, aspirations, sense of self-worth and managerial skills, and on the other, the realities of specific occupational and professional choices. During the course each participant provides and analyzes a wide variety of data for better insight into his career future and the specific steps leading to greater goal fulfillment. Designed for ninth- and 10th- quarter students.

Prof. Croke

Summer Qtr.

45.265 Production Management

(Prereq. 49.251) 4 Q.H.

Production management is concerned with planning and controlling the use of such resources as men, materials, facilities, technology, and information to accomplish the objectives of an organization. The course provides a basic understanding of the management of the production system—its design, operation, control, evolution, and modification—to enhance managerial decision making in technical matters. Topics discussed are: design of product and process, human factors concepts, capacity considerations, man-systems, work measurement, wage administration, production planning, inventory management production control, and product quality management.

Profs. Ammer, Godin, Olive, and Shore

All Quarters

45.275 Labor Law

(Prereq. 45.260, 39.275) 4 Q.H.

The changing judicial principles and statutory standards of employment and management-union relations since 1800.

Prof. Myers

Fall and Winter Qtrs.

45.276 Seminar in Collective Bargaining

(Prereq. 45.275) 4 Q.H.

Cases or reports on problems faced by industrial relations departments dealing with employees through collective bargaining. Individual research.

Prof. Myers

Spring Qtr.

Transportation

48.101 Principles of Transportation

(Prereq. 39.105) 4 Q.H.

The political, social, and economic functions of transportation; development and structure of the domestic transportation system; the nature of government regulation and promotion of the several modes.

Prof. Lieb

Fall and Winter Qtrs.

48.102 Current Issues in Transportation Policy

(Prereq. 48.101) 4 Q.H.

An overview of the regulatory process and its impact on the domestic transportation system. Critical examination of topical policy issues which confront carriers, shippers, and the agencies of regulation.

Prof. Lieb

Fall and Winter Qtrs.

- 48.103 Carrier Management** (Prereq. 48.101) 4 Q.H.
The transportation system from the carrier's viewpoint; managerial response to a heavily regulated and rapidly expanding environment; focus on carrier decision-making involving routes, scheduling, financing, and pricing of services.
Prof. Lieb Fall and Winter Qtrs.
- 48.104 Physical Distribution Management** (Prereq. 43.120) 4 Q.H.
Movement, distribution, and control of raw material and finished goods flows. Examination of the importance of inventory control, scheduling, warehousing, and transportation in the design and operation of distribution systems.
Prof. Lieb Spring and Summer Qtrs.
- 48.105 Urban Transportation** (Prereq. 39.105) 4 Q.H.
Impact of private and public transport systems on urban development. The planning and implementation of government programs concerning construction and promotion of system alternatives.
Prof. Lieb Spring and Summer Qtrs.

General Business

- 49.100 Introduction to Business** 4 Q.H.
The business organization as a system of interrelated functions and operations; the interactions between the organization and its environment; and the role of management in business organizations.
College of Business Administration Faculty Fall and Winter Qtrs.
- 49.101 Introduction to the Computer** (Prereq. 10.125) 4 Q.H.
Provides the undergraduate business student with a basic computer capability. The student develops a familiarity with the computation center and experience in the use of canned programs. Skills developed are reinforced and augmented in core and elective courses in upper-class years.
Profs. Briggs, Grossman, and Staff Fall and Winter Qtrs.
- 49.107 Small Business Management** 4 Q.H.
The characteristics and problems of small enterprises at different stages of their life cycle, from post-natal to maturing periods. Focus is on the operating problems and strategies of established small enterprises for the benefit of students whose careers as owner-managers and consultants, or in venture financing, are likely to be centered on the smaller business.
Prof. Olive Spring Qtr.
- 49.108 Opportunity Identification and Analysis** (Prereq. 45.212 or consent of instructor) 4 Q.H.
Emphasis is on risk taking in new business ventures, rather than on day-to-day management. Cases and readings focus on the opportunities, risks and contributions necessary for success in an entrepreneurial career. Case discussions on starting or acquiring companies stress the finding of a suitable opportunity, appraisal of profit potential, determination of acceptable purchase price, negotiation of terms, raising of capital, and organization of a new business.
Profs. Olive and Timmons Fall Qtr.
- 49.109 Statistical Methods for Data Analysis** (Prereq. 49.205) 4 Q.H.
Examines some of the most commonly used methods for analyzing large and small quantities of data. Included are: 1. regression and correlation, 2. chi-square, 3. discriminant, 4. factor analysis, 5. sampling, and 6. designing and analyzing experiments. Extensive use is made of laboratory (problem) sessions and of canned computer programs which require no previous computer experience.
Prof. Wiseman Spring Qtr.

49.155 Legal Aspects of Business

4 Q.H.

The legal aspects of business transactions and business relationships involving contracts, agency, negotiable instruments, suretyship, and guaranty.

Profs. Fiumara and Scioletti

All Quarters

49.156 Management Planning and Control

(Prereq. 41.105, 45.210) 4 Q.H.

Develops systematic and integrated framework of concepts and theory useful for consideration of management control, and for the design and implementation of management control systems. Integrates pertinent material from the formal disciplines, particularly those in organizational behavior, with "control." Develops skill in analyzing real-world situations involving management control considerations. Achieves higher level of understanding of the interrelated nature of the management control process with other processes operating within an organization and the broader functional areas of business. The course covers the following topics: basic conceptual framework, responsibility centers, measurement, expense centers, profit centers and transfer pricing, investment centers, planning and budgeting, control reporting, incentives for performance, organizational relationships (role of controller), and evaluation of comprehensive systems.

Prof. Caplan

Fall and Winter Qtrs.

49.206 Management Information Systems

(Prereq. 49.251) 4 Q.H.

The design and implementation of a computer-based management information system. Includes programming, flow diagramming, and documentation of business subsystems. A term project requirement provides experience with realistic design problems and computer application. Computer Model 6000 Series is used.

Prof. Gubellini

Spring and Summer Qtrs.

49.210 Legal Aspects of Business Organization and Property

(Prereq. 49.155) 4 Q.H.

The legal aspects of the typical forms of business ownership. The law of sales and property transactions in business.

Profs. Fiumara and Scioletti

Fall and Winter Qtrs.

49.212 The Law of Wills, Trusts, and Estates

4 Q.H.

The requirements of a valid will, claims of and against the estate, and final distribution of property. The requirements of a valid inter-vivos trust, a testamentary trust, the responsibilities and liabilities of a trustee, the rights of beneficiaries, and administration of an estate, both formal and informal.

Prof. Scioletti

Spring Qtr.

49.240 Law in Society

4 Q.H.

Acquaints the student, as a member of society, with his legal rights, obligations, and responsibilities applicable in his relationship with others and with the state.

Profs. Fiumara and Scioletti

Fall, Winter, and Spring Qtrs.

49.250 Quantitative Methods I

(Prereq. 10.125) 4 Q.H.

Topics treated are: descriptive statistics, statistical inference (probability), sampling, payoff table analysis, probability distributions, statistical estimation, hypothesis testing, and Bayesian statistics. The course is characterized by a decision-making orientation.

Profs. Briggs, Grossman, Moriarty, Parsons, Shelley, and Wiseman

Fall and Winter Qtrs.

49.251 Quantitative Methods II

(Prereq. 49.250) 4 Q.H.

The role of the model as an analytical device designed to aid the decision maker. Simple regression and correlation, multiple regression and correlation, exponential smoothing, linear programming, network models, and simulation models.

Prof. Briggs, Grossman, Moriarty, Parsons, Shelley, and Wiseman

Spring and Summer Qtrs.

49.258 Accounting Systems and Data Processing

(Prereq. 41.112) 4 Q.H.

Information flows throughout the organization; the use of quantitative decision techniques in planning and control; the concept of the integrated and the total information system; and the

applications of computer programming to business, nonprofit organizations, government, and other areas.

Prof. Grossman

Fall and Winter Qtrs.

49.261 Quantitative Models in Operations Analysis

(Prereq. 45.265) 4 Q.H.

The use of quantitative models for understanding problems in the management of complex systems. The course draws on linear programming, integer programming, transportation method, dynamic programming, simulation, and network analysis. These techniques are used in the following problem areas: capital investment, replacement, materials handling, line balancing, project scheduling, and planning and control.

Prof. Shore

Spring Qtr.

49.262 Independent Study

4 Q.H.

For a student who has received approval of a proposal to undertake independent study in lieu of any course required in the various concentrations. Each teaching area considers proposals presented by students to its Independent Studies Committee for evaluation and approval. Every proposal requires a detailed outline of the objectives and plan of study and must be accompanied by a supporting statement from the supervising faculty member under whose direction the study will take place. A copy of the final report prepared by the student will be presented to the appropriate Independent Studies Committee. Further information about the Independent Studies Program can be obtained from Area Coordinators.

College of Business Administration Faculty

All Quarters

Education Foundations

50.114 Education and Social Science

4 Q.H.

Introduction to the social scientific analysis of education and a brief exposure to the methods and thinking of these social sciences. The student should develop an orientation to and awareness of the complexity of the educational scene in America and the world today.

Staff

Fall and Winter Qtrs.

50.121 Human Development and Learning I

4 Q.H.

Developmental processes from prenatal life up to adolescence. Theories of learning and personality, with research and case material covering major aspects of psychological development.

Profs. Bernheim, Hanks, and Nichols

All Quarters

50.131 Human Development and Learning II

4 Q.H.

Continuation of Human Development and Learning I. Significant aspects of adolescence; physical, social, and psychological factors as they influence adolescent behavior.

Profs. Gulo and Rosenthal

All Quarters

50.132 Creative Expression in Children

(Prereq. 50.121) 4 Q.H.

Study of creativity and the role which creative expression plays in the psychological development of the young child. Examination of various media (i.e., visual, dramatic, photographic, literary) and their use in the educational setting.

Prof. Bernheim

Spring and Summer Qtrs.

50.133 Educational Applications of Social Psychology (Prereq. 50.121 or 50.131) 4 Q.H.

Focus on theory and research in social psychology especially relevant to education. Areas covered are: prejudice in the classroom; the school as a setting for manifestation of authoritarian personality; attitude organization and change in an educational environment; the class and the clique as "small groups"; the expression of need for achievement in various school structures; and related topics.

Prof. Hanks

Spring and Summer Qtrs.

50.134 Mental Health in Teaching

(Prereq. 50.121 or 50.131) 4 Q.H.

Factors involved in the choice of teaching as a career, and of psychological and occupational

factors which contribute to teacher happiness and dissatisfaction, adjustment, and maladjustment. Examination of these factors is a background against which to consider: 1. what teachers can do to foster healthy personalities, 2. how to deal with psychological forces in the classroom, and 3. steps to strengthen the emotional development of the normal child.

Prof. Gulo

Spring and Summer Qtrs.

50.135 Cross-Cultural Studies of Child Rearing and Education

(Prereq. 50.121 or 50.131) 4 Q.H.

Patterns of socialization in contrasting cultures, and possible and/or demonstrated resultants in areas of personal development of concern to educators. Readings are mainly ethnographic studies of child rearing and psychological investigations of children from contrasting backgrounds.

Prof. Herzog

Spring and Summer Qtrs

50.136 Language and Cognition: Educational Implications

(Prereq. 50.121 or 50.131) 4 Q.H.

Development of language and thought in the child: concept learning, problem solving, and language acquisition. Particular consideration given to the implications of current research and theory in these areas for educational practice.

Prof. Nichols

Spring and Summer Qtrs

50.137 Seminar in Adolescent Psychology

(Prereq. 50.131) 4 Q.H.

An in-depth examination of the motivational, intellectual, social, and emotional development of adolescents from the end of preadolescence to the beginning of young adulthood. Emphasis is also on current issues such as drug use, sexual behavior, and vocational problems.

Prof. Gulo

Spring and Summer Qtrs

50.138 Seminar in Human Learning and Motivation

(Prereq. 50.121 or 50.131) 4 Q.H.

Survey and analysis of the literature on human learning and motivation. Emphasis on interaction between human learning and motivation in the developmental process and in the classroom.

Prof. Rosenthal

Spring and Summer Qtrs

50.139 Seminar in Early Childhood Development

(Prereq. 50.121) 4 Q.H.

The theory and research regarding the cognitive, personality, and social development of children from birth to six years, with respect to their implications for early childhood education. Various existing programs examined and new directions explored.

Prof. Bernheim

All Quarters

50.141 Measurement and Evaluation

(Prereq. 51.135) 4 Q.H.

The fundamentals of measurement; the use of basic statistical concepts and techniques evaluation of standardized and teacher-made tests.

Staff

All Quarters

50.152 Comparative Education

4 Q.H.

Education in other nations. Relationships with the political, economic, social, and cultural milieu in Western and Eastern Europe, the Near and Far East.

Prof. Baptiste

Fall, Winter, and Spring Qtrs

50.153 Philosophy of Education

4 Q.H.

Objective is to help participants examine their own purposes in relation to those of the school as an institution. Philosophical writings (on topics such as the ethics of educational intervention, the delineation of educational concepts, the educational messages of long-range speculations and utopias, and normative assumptions underlying educational policies) and the practice of education in the class are the main materials. Dialogue is the main method.

Prof. Meier

Fall, Winter, and Spring Qtrs

50.154 Current Issues in American Education

4 Q.H.

An analysis of the variety of educational issues confronting elementary and secondary teachers. Attempts will be made to place issues in a historical context, and to expose students

to a variety of educational programs in the Boston area that are palpable efforts to deal with the issues.

Profs. Baptiste and Meier

Fall, Winter, and Spring Qtrs.

50.161 Seminar in Group Process

4 Q.H.

A study of the structure, dynamics, and function of face-to-face groups leading to learning about goal achievement and task orientation. The course operates mainly by committee or group instrumentation. A serious student should gain an understanding of the function of informal relationships within formal organizations, the various roles within groups, peer relationships, superior-subordinate relationships, authority and intimacy, and the inclusion and exclusion processes. Also involved is the aspect of self-understanding.

Prof. Meier

Winter and Spring Qtrs.

50.163 Schools as Social Systems

(Prereq. 50.114 or equiv.) 4 Q.H.

An analysis of schools as sociocultural subsystems within the larger society. Functional interrelationship between student and school subcultures; status and role systems, and authority structures in American schools.

Prof. Brown

Winter and Spring Qtrs.

50.164 Class and Ethnic Relations in Education

(Prereq. 50.114 or equiv.) 4 Q.H.

The various ways in which the American class system and patterns of ethnic group relations have affected, and have been affected by, American education. The limitations and potential of educational institutions with respect to the resolution of intergroup conflicts and the establishment of equal educational opportunities.

Prof. Zalinger

Winter and Spring Qtrs.

50.165 Organization and Politics of School Systems

(Prereq. 50.114 or equiv.) 4 Q.H.

The political sociology of school systems in the U.S. An analysis of the power and authority structures in contemporary education. Who decides what and how? Who controls the system? How are the various interest groups organized? What are the mechanisms for conflict resolution? The relationship between professional and nonprofessional interest groups.

Prof. Brown

Winter and Spring Qtrs.

50.166 Teaching and the Human Service Professions

(Prereq. 50.114 or equiv.) 4 Q.H.

An analysis of responsibility for socialization in modern society, focusing on the inputs of teachers and other school personnel, various human service professions, and the family and informal peer groups. These topics are approached through sociological and historical materials concerning the development of selected school and human service professions, and by comparison of contemporary American practice with child-rearing arrangements in other modern nations.

Prof. Herzog

Winter and Spring Qtrs.

50.167 Education and Psychosocial Development

(Prereq. 50.114 or equiv.) 4 Q.H.

Theories and research on the socialization functions of education. The relative influence of early vs. post-childhood socialization; professional and adult socialization; the role of diverse educational experiences and institutions in personality development and change.

Profs. Durham and Zalinger

Winter and Spring Qtrs.

50.168 Education and Social Change

(Prereq. 50.114 or equiv.) 4 Q.H.

A sociological exploration of educational systems as independent and dependent variables in social change. Instances of planned educational change in various countries and their implications for contemporary American society.

Staff

Winter and Spring Qtrs.

Education—Instruction

51.124 Modern Mathematics Curricula

4 Q.H.

Mathematics curricula in junior and senior high schools, including experimental programs,

presented in their historical setting.

Prof. McLean

Spring Qtr.

51.131 Fundamentals of Arithmetic I

4 Q.H.

Techniques of teaching arithmetic so that underlying principles are stressed. Topics are selected to serve as a foundation in mathematics appropriate for any elementary program. Deductive and inductive reasoning, numeration systems, elementary concepts of set theory, whole numbers and rational numbers and their properties, decimal numerals, linear equations, and inequalities.

Prof. Clark

Fall and Winter Qtrs.

51.132 Fundamentals of Arithmetic II

(Prereq. 51.131) 4 Q.H.

Continuation of Fundamentals of Arithmetic I. Rate, ratio and percent, informal geometry, elementary theorems and proofs, similarity and trigonometry, area of volume, elements of spherical geometry.

Prof. Clark

Spring and Summer Qtrs.

51.135 Analysis of Teaching and Educational Process

(Prereq. 50.131) 4 Q.H.

The relationships that exist between instructional objectives and teaching behavior; applications of human development and learning concepts as they relate to subsequent specialized teaching methods and materials. Research results and promising theory are used to extend the prospective teacher's concepts of the teaching function.

Staff

Fall and Winter Qtrs.

51.139 Writing and the Teaching of Writing

(Prereq. 51.135) 4 Q.H.

A study of the logical and rhetorical bases of exposition and argumentative writing; the role of definition in exposition and argumentation; relationships of assumptions, assertions, and implications; the nature of proof in the sciences, social sciences, and the humanities; strategies of argumentation; the affective consequences of word choice and sentence structure.

Prof. Favat

Spring Qtr.

51.140 Methods and Materials of Teaching Modern Languages I

(Prereq. 51.135) 4 Q.H.

The most effective types of classroom activities, subject unit organization, assignments, examinations, and teaching aids used in modern language. The role of the language laboratory with its problems of selecting equipment, scheduling pupils, planning tapes and content of drill exercises, evaluating results, and coordinating its functions with conventional classroom instruction.

Prof. Petralila

Fall and Winter Qtrs.

51.141 Elementary Education Compendium I

(Prereq. 51.135) 4 Q.H.

The curriculum is analyzed on the basis of the overall objectives of the American elementary school. Students evaluate and organize units of work which are appropriate to the level at which they plan to teach. The integrated approach to learning is emphasized, but the integrated approach to science, social studies, and language arts subjects is given special attention.

Prof. Lee in charge

Fall and Winter Qtrs.

51.142 Elementary Education Compendium II

(Prereq. 51.141) 4 Q.H.

The objectives, activities, and methods of evaluation in the elementary school are continued, with special attention to the areas of music, art, and physical education.

Prof. Lee in charge

Spring and Summer Qtrs.

51.143 Methods and Materials of Teaching English

(Prereq. 51.135) 4 Q.H.

An introduction to the structure and functions of language as they apply to the teaching of English; curriculum and planning in English. The unit approach; specific techniques of teaching reading and literature, grammar and usage, written and oral composition, listening, spelling, vocabulary, and the use of mass media.

Prof. Favat

Fall and Winter Qtrs.

51.144 Methods and Materials of Teaching Modern Languages II

(Prereq. 51.140) 4 Q.H.

Continuation of Methods and Materials of Teaching Modern Languages I.

Prof. Petralia

Spring and Summer Qtrs.

51.145 Methods and Materials of Teaching Mathematics

(Prereq. 51.135) 4 Q.H.

Theory and practice of teaching secondary mathematics, including a discussion and evaluation of instructional problems. Lesson planning and presentations by individual students afford appropriate practice and serve as the medium of instruction.

Prof. McLean

Fall and Winter Qtrs.

51.147 Methods and Materials of Teaching the Sciences

(Prereq. 51.135) 4 Q.H.

The prospective science teacher is introduced to the following: the philosophies of science and their applicability in society and the secondary school; science curriculum development and application; and pertinent methods and materials in science education.

Prof. Miner

Fall and Winter Qtrs.

51.149 Methods and Materials of Teaching Social Studies

(Prereq. 51.135) 8 Q.H.

A field-oriented course conducted off campus in one or more schools of cooperating public school systems where College of Education students work with pupils of the school individually and in small groups. Techniques of planning, development of curriculum materials, utilization of audio-visual equipment, simulations, development and implementation of evaluation instruments, presentation of original materials in class.

Prof. Tedesco

Fall and Winter Qtrs.

51.151 Student Teaching and Seminar

Prereq. formal acceptance into and completion of Advanced Professional sequence with minimum 2.0 Q.P.A., both overall and in teaching major) 8 Q.H.

Full-time participation in a university-arranged and supervised school program designed to provide opportunity for the analysis of learning and teaching and for the demonstration, evaluation, and development of teaching skills.

Education—Reading**51.126 Teaching Reading in Secondary Schools**

4 Q.H.

For English and Social Studies majors in the College of Education who are preparing for teaching in the junior or senior high schools. Basically, the same approach and organization applies to this course as to the elementary level course. (One quarter)

Prof. Maguire

Spring Qtr.

51.135 Fundamentals of Reading I

6 Q.H.*

The basic, introductory course in developmental reading for prospective elementary teachers. In the first term the emphasis is on language and symbolic process as it relates to beginning reading. The word recognition and meanings growth areas are studied in detail, as are some methods and techniques of testing and grouping. An introduction to some reading books and materials, methods of teaching, and the psychology of learning to read. Tutorial work begins with students.

Prof. Howards in charge

Fall and Winter Qtrs.

51.136 Fundamentals of Reading II

(Prereq. 54.135) 6 Q.H.*

Continuation and extension of the first term. Study skills; speed and fluency growth areas. The tutorial work is extended and greater familiarity with books, materials, and methods achieved.

Prof. Howards in charge

Spring and Summer Qtrs.

51.141 Remedial Reading

(Prereq. 54.136) 4 Q.H.

For prospective teachers in the primary unit. This introductory course familiarizes the student

including lab.

with some of the most commonly known reading problems in the typical classroom as well as in the reading clinic; analysis and evaluation of the typical diagnoses of such problems; corrective programs. Tutorial work with a retarded reader, with each student keeping a log or journal of his work with a particular reading problem.

Prof. Burg

Fall and Winter Qtrs.

54.142 Linguistics and Reading

(Prereq. 54.136) 4 Q.H.

For elementary level teachers (primary unit). The major objective is to translate the knowledge gathered from structural and descriptive linguistics into useful classroom instruction, which includes not only reading instruction, but basic instruction in the related language skills. The contributions, particularly of such writers as Fries, Barnhart, Bloomfield, and LeFevre, are experimented with and analyzed.

Prof. Kaufman

Spring Qtr.

54.151 Children's Literature

(Prereq. 54.136) 4 Q.H.

For prospective teachers in the primary unit. A comprehensive survey and critical analysis of the books and materials available for basic reading instruction and for supplementary reading activities. After a massive review of the available literature for the children, especially in grades K-3, each student is responsible for developing some material of his own for trial with subjects. The ultimate goal is to make the student aware of what is available and how to use it most effectively in a reading program.

Prof. Buffone

Spring Qtr.

Education—Speech and Hearing—Special Education

55.121 Introduction to Special Education

4 Q.H.

An introductory survey course which emphasizes the characteristics and needs of exceptional children and youth. Recognition of exceptional children in the classroom including the trainable and educable retarded, emotionally disturbed, social offender, brain injured, speech-, hearing-, and language-impaired, the physically handicapped, the visually handicapped, and the gifted.

Fall and Winter Qtrs

55.122 Introduction to Speech and Hearing Therapy

4 Q.H.

Normal language and speech development in children. Analysis of the most prevalent organic and functional communication disorders, with emphasis on identification techniques. Lectures, demonstrations, and 15 clock hours of observation in the University clinic.

Spring and Summer Qtrs

55.124 Anatomy, Physiology, and Neurology of the Speech and Hearing Mechanism

4 Q.H.

Physiological and mechanical components of speech and hearing. The skeletal, muscular and nervous systems. Lectures and laboratory demonstrations.

Spring and Summer Qtrs

55.126 Communication Skills

4 Q.H.

The importance of effective communication in the teaching profession. Utilization of the knowledge of the scientific principles of voice production, with practice in effective vocal usage. Integration of communication skills with regular classroom curriculum. Lectures, exercises, demonstration, and observations.

Fall and Winter Qtrs

55.131 Normal Development of Language and Speech

(Prereq. 55.122) 4 Q.H.

Analysis of theories related to concept formation, development, and utilization of symbols from birth to maturation. Foundations and developmental phases of language and speech. The significance of physiological, neurological, psychological, and intellectual factors affecting language and speech development. Case studies, lectures, demonstration, and

observations.
Prof. Ferullo Fall and Winter Qtrs.

55.133 Introduction to Linguistics and Phonetics (Prereq. 55.122) 4 Q.H.
Learning and applying the International Phonetic Alphabet. A consideration of articulated phonemes and allophones, sound change, structural and descriptive linguistics as applied to problems in communication. The nature of language. Lectures, demonstrations, and observations.
Mrs. West Fall and Winter Qtrs.

55.134 Organic Speech Disorders (Prereq. 55.124) 4 Q.H.
Etiology, diagnosis, and prognosis of non-neurological communication disorders; consideration of therapeutic procedures in cleft-palate and cleft-lip, and related maxillo-facial abnormalities; laryngectomy; and tongue-thrusting. Lectures, observations, and demonstrations.
Prof. Ferullo Spring and Summer Qtrs.

55.141 Methods and Materials in Speech and Hearing and Articulation Disorders (Prereq. 51.135) 4 Q.H.
Various materials and methods used in the correction of speech problems. The rationale of the corrective process; selection, preparation, and presentation of materials. Speech correction and improvement through an integrated approach.
Staff Fall and Winter Qtrs.

55.142 Introduction to Audiology (Prereq. 55.124) 4 Q.H.
The physics of sound, anatomy, physiology, and neurology of the ear. Basic techniques in audiometric testing. Lectures, demonstrations, and observations.
Spring and Summer Qtrs.

55.143 Diagnostic Techniques in Speech and Hearing (Prereq. 55.134) 4 Q.H.
Diagnosis and therapy in communication disorders in children and adults; tests utilized in evaluation of individuals with language, speech, and hearing disorders. Demonstrations, case histories, and experience in the University clinic.
Fall and Winter Qtrs.

55.144 Clinical Practice in Speech and Hearing I (Prereq. 55.131, 55.133) 4 Q.H.*
Practicum in language, speech, and hearing diagnosis and therapy in the University clinic. Students should reserve a block of hours for clinic practicum. A minimum of 100 hours.
Spring and Summer Qtrs.

55.145 Functional Speech Disorders (Prereq. 55.124) 4 Q.H.
Etiology, diagnosis, and prognosis of communication disorders of nonorganic origins. Language and speech disorders and the psychodynamics of personality development. Lectures and demonstrations, case histories, and experience in the University clinic.
Prof. Ferullo Fall and Winter Qtrs.

55.152 Speechreading and Auditory Training
Various speech-reading methods; an integrated approach to the treatment of hard-of-hearing individuals; auditory training techniques and materials.
Prof. Ferullo Spring Qtr.

55.154 Introduction to Stuttering (Prereq. 55.145) 4 Q.H.
A consideration of some of the major theories of stuttering. Diagnosis and therapy procedures. Lectures, demonstrations, and observations.
Staff Spring Qtr.

55.155 Clinical Practice in Speech and Hearing II
(Prereq. 55.144 and 100 in University clinic) 4 Q.H.*
Practicum in language, speech, and hearing diagnosis in a medical and/or rehabilitation

*Including lab.

center; a multidisciplinary approach to the treatment of children and adults.

Mrs. Troutman

Fall and Winter Qtrs.

55.230 Introduction to Emotional Disturbances in Children

(Prereq. 55.121, 19.201 or equiv.) 4 Q.H.

An introduction to the etiology, dynamics, and diagnosis of emotional disturbance in children. Special attention is given to emotional blocks to learning.

Staff

Fall and Winter Qtrs.

55.237 Introduction to Learning Disabilities

(Prereq. 55.121) 4 Q.H.

An introduction to the learning problems of children with perceptual-motor handicaps, but who generally meet the criteria of normal intelligence.

Staff

Fall and Winter Qtrs.

55.240 Psychology of the Mentally Retarded

(Prereq. 55.121) 4 Q.H.

An analysis of the nature and needs of the retarded individual, with emphasis on characteristics of physical, mental, social, and emotional development. Implications of these characteristics for educational, social, and employment training programs are explored in conjunction with parental and community reactions and involvement. The positive ultimate role of the retarded as a successful citizen, employee, and homemaker is a major emphasis.

Staff

Spring and Summer Qtrs.

55.250 Introduction to Rehabilitation

(Prereq. 55.121) 4 Q.H.

An overview of and an orientation to the field of rehabilitation, including its historical development, psychological implications, and sociological dimensions.

Staff

Spring and Summer Qtrs.

Physical Education

Most courses are coeducational. Some courses for men and women will be offered separately where deemed advisable.

60.140 Analysis and Teaching of Physical Activities I

(Prereq. 60.131; women only) 3 Q.H.*

Analysis of performance and methods of teaching in the areas of gymnastics and racquet sports.

Staff

Fall Qtr.

60.141 Analysis and Teaching of Physical Activities II

(Prereq. 60.131; women only) 3 Q.H.*

Analysis of performance and methods of teaching in the areas of team sports (indoor) and aquatics.

Staff

Winter Qtr.

60.142 Analysis and Teaching of Physical Activities III

(Prereq. 60.132; women only) 3 Q.H.*

Analysis of performance and methods of teaching in the areas of field sports and dance.

Staff

Spring Qtr.

60.143 Winter Sports

1 Q.H.

Five-day resident session at North Conway, New Hampshire. Participation according to ability in classes of Hannes Schneider Ski School. Evening seminars in skiing theory and teaching methods.

Staff

Winter Qtr.

60.160 Instructional Technology

2 Q.H.

Survey of selection, evaluation, preparation, and production of audio-visual media, instructional television, and programmed learning. Some opportunity to work with related equipment.

Staff

Fall Qtr.

60.220 Program and Methods in Elementary School Physical Education Activities

(Prereq. 19.102, 50.121, 50.131; women only) 4 Q.H.

Philosophy, program-planning, and methods for teaching children; guided observation experiences with children in schools; individual teaching presentations and evaluations in basic motor skills, dance activities, games, gymnastics, and sports.

Staff

Winter Qtr.

60.230 Advanced Teaching and Analysis

(Prereq. 60.140, 60.141, 60.142; women only) 3 Q.H.*

Advanced study of teaching methods and analysis in one of the areas studied in Physical Education 60.140—42 and one individual sport.

Staff

Winter and Spring Qtrs.

61.212 Handball and Squash

(Prereq. men only) 1 Q.H.*

The skills and techniques involved in the teaching of handball and squash. Special emphasis on skills involved, rules, courtesies, and strategies in each sport.

Staff

Fall and Winter Qtrs.

61.220 Survey of Recreational Sports

(Prereq. men only) 1 Q.H.*

Recreational activities such as archery, deck tennis, table tennis, horseshoes. Emphasis on rules, teaching techniques, place in the program.

Staff

Spring and Summer Qtrs.

61.230 Secondary School Dance

1 Q.H.*

The techniques of dance instruction at the junior and senior high school levels.

Staff

Fall and Winter Qtrs.

61.237 Team Sports III

(Prereq. men only) 1 Q.H.*

Techniques of teaching soccer, speedball and softball; special emphasis placed on rules, courtesies, and strategies.

Staff

Spring and Summer Qtrs.

61.241 Advanced Wrestling (Prereq. 61.240 or consent of instructor; men only) 2 Q.H.*

Advanced techniques in coaching wrestling at the senior high school and college levels; emphasis on fundamentals of a more advanced nature; care of athletes, officiating, conduct of meets.

Staff

Spring and Summer Qtrs.

61.242 Advanced Boxing (Prereq. 61.240 or consent of instructor; men only) 2 Q.H.*

Advanced techniques in coaching boxing; emphasis on offensive and defensive techniques, rules, and officiating.

Staff

Spring and Summer Qtrs.

61.263 Methods and Materials in Physical Education

(Prereq. 61.236 or consent of instructor; men only) 4 Q.H.

Methods and materials to be used in curriculum development, class management, and teaching preparation for student teaching.

Staff

Fall and Winter Qtrs.

61.265 Advanced Football (Prereq. 61.236 or consent of instructor; men only) 3 Q.H.*

Basic techniques in coaching football at the senior high school and college levels. Emphasis on individual and team play, offensive and defensive systems, role of head and assistant coaches, scouting, use of teaching aids, team management.

Staff

Spring and Summer Qtrs.

61.266 Advanced Basketball (Prereq. 61.235 or consent of instructor; men only) 3 Q.H.*

Basic techniques at the senior high school and college levels. Emphasis on systems of offensive and defensive team play, scouting, use of teaching aids, team management.

Staff

Spring and Summer Qtrs.

61.267 Advanced Baseball (Prereq. 61.235 or consent of instructor; men only) 3 Q.H.*

Basic techniques in coaching baseball at the senior high school and college levels. Emphasis

including lab.

on individual and team play, role of head and assistant coaches, team management.

Staff

Spring and Summer Qtrs.

61.268 Advanced Track (Prereq. 61.236 or consent of instructor; men only) 3 Q.H.*

Basic techniques of coaching track and field at the senior high school and college levels. Emphasis on care and training of athletes, practice schedules, coaching techniques, conduct of meets.

Staff

Spring and Summer Qtrs.

61.280 Camp Leadership

(Prereq. men only) 2 Q.H.*

Introduction to the procedures of organized camping and outdoor activities. Emphasis placed on camp skills, equipment, counseling, trip leadership, laboratory experiences.

Staff

Spring and Summer Qtrs.

62.10A Beginning Swimming

1 Q.H.*

Instruction in basic swimming skills, with emphasis on personal water safety.

Staff

All Quarters

62.10B Intermediate Swimming

(Prereq. 62.10A or equivalent) 1 Q.H.*

Instruction in basic and advanced swimming skills, with emphasis on form and efficiency.

Staff

All Quarters

62.10C Advanced Swimming

(Prereq. 62.10B or equivalent) 1 Q.H.*

Instruction in advanced swimming skills with emphasis on form and efficiency.

Staff

All Quarters

62.10D Diving

(Prereq. 62.10A or equivalent) 1 Q.H.*

Instruction in basic one-meter and three-meter springboard diving in all five categories of dives.

Staff

All Quarters

62.10E Competitive Swimming

(Prereq. 62.10B or equivalent) 1 Q.H.*

Instruction in the four competitive strokes, starts, and turns, with emphasis on speed and conditioning.

Staff

Winter and Summer Qtrs

62.10F Synchronized Swimming

(Prereq. 62.10B or equivalent) 1 Q.H.*

Instruction in basic synchronized swimming skills, with emphasis on stunts, rhythmic swimming, and choreography.

Staff

Winter and Spring Qtrs

62.10G Water Polo

(Prereq. 62.10B or equivalent) 1 Q.H.*

Instruction in beginning water polo, with emphasis on personal skill, offensive and defensive team play.

Staff

Fall and Spring Qtrs

62.10J Survey of Aquatic Activities

(Prereq. 62.10B or equivalent) 1 Q.H.*

Competitive swimming, diving, skin diving, synchronized swimming, and water polo, with emphasis on recreational values.

Staff

All Quarters

62.10K Senior Life Saving

(Prereq. 62.10B or equivalent) 1 Q.H.*

Instruction in life-saving skills, or techniques and theory. Red Cross Certification possible.

Staff

All Quarters

62.10L Water Safety Instruction

(Prereq. 62.10B, 62.10K) 1 Q.H.*

Instruction in techniques, theory and teaching methods in swimming and life-saving courses. Red Cross Certification possible.

Staff

Spring Qtr.

62.10M Beginning Scuba

(Prereq. 62.10B or equiv.) 1 Q.H.*

Instruction in basic skin diving and scuba diving skills, with emphasis on personal safety.

Staff

All Quarters

*Including lab.

62.10P Canoeing	(Prereq. 62.10B or equiv.) 1 Q.H.*
Instruction in basic canoeing skills.	
Staff	Summer and Fall Qtrs.
62.10Q Sailing	(Prereq. 62.10B or equiv.) 1 Q.H.*
Instruction in rowing and in basic sailing skills.	
Staff	Summer and Fall Qtrs.
62.10S Advanced Beginning Swimming	1 Q.H.
Continuation of elementary swimming. Emphasis on basic stroke improvement and understanding and gaining confidence in deep water.	
Staff	All Quarters
62.12A Beginning Folk and Square Dance	1 Q.H.*
Introduction to folk and square dance at the beginning and intermediate levels.	
Staff	Fall Qtr.
62.12B Intermediate Folk and Square Dance	(Prereq. 62.12A or equiv.) 1 Q.H.*
Instruction in folk and square dance at the intermediate and advanced levels.	
Staff	Winter and Spring Qtrs.
62.12C Ethnic Dance Forms	(Prereq. 62.12A or consent of instructor) 1 Q.H.*
A study of primitive, folk, and national dance forms.	
Staff	Spring Qtr.
62.12E Beginning Modern Dance	1 Q.H.*
Introduction to modern dance technique and improvisation.	
Staff	Fall and Winter Qtrs.
62.12F Intermediate Modern Dance	(Prereq. 62.12E or equiv.) 1 Q.H.*
Intermediate modern dance technique and improvisation.	
Staff	Winter and Spring Qtrs.
62.12H Ballet I	1 Q.H.*
An introduction to the fundamental techniques and terminology of the classic ballet.	
Staff	Fall Qtr.
62.12J Ballet II	(Prereq. 62.12H or equiv.) 1 Q.H.*
A continuation of 62.12H. Progression into the expressive and choreographic use of classic ballet techniques.	
Staff	Winter Qtr.
62.12L Beginning Jazz Dance	1 Q.H.*
Introduction to several contemporary styles of jazz dance technique.	
Staff	All Quarters
62.13P Beginning Gymnastics Orientation	1 Q.H.*
Development of knowledge and skill necessary for competent performance in the orientation skills of tumbling, trampoline, and vaulting at the beginning level. Coed.	
62.13Q Beginning Men's Apparatus	(Prereq. 62.13P or equiv.; men only) 1 Q.H.*
Development of knowledge and skill for competent performance at the beginning level on pommel horse, parallel bars, horizontal bars, and rings.	
62.13R Beginning Women's Floor Exercise and Apparatus	(Prereq. 62.13P or equiv.; women only) 1 Q.H.*
Development of knowledge and skill for competent performance in Floor Exercise, and beginning bars and uneven parallel bars.	
62.13S Intermediate Gymnastics	(Prereq. 62.13P and 62.13R or equiv.; women only) 1 Q.H.*
Development of skill and knowledge for competent performance at the intermediate level in the competitive areas for women, including floor exercise, vaulting, beam and uneven bars.	
Including lab.	

62.13T Intermediate Gymnastics (A)

(Prereq. 62.13P, 62.13Q and 62.13T or equiv.; men only) 1 Q.H.*

Development of skill and knowledge for competent performance at the intermediate level in three of the six competitive areas for men. This includes the choice of floor exercise, side horse vaulting, pommel horse, parallel bars, horizontal bars, or rings.

62.13U Intermediate Gymnastics (B)

(Prereq. 62.13P, 62.13Q and 62.13T or equiv.; men only) 1 Q.H.*

Development of skill and knowledge for competent performance at the intermediate level in three of the six competitive areas for men not chosen in Intermediate Gymnastics A.

62.14A Beginning Badminton

1 Q.H.*

Instruction in beginning badminton skills, rules, strategy, and care of equipment.

Staff

Spring and Summer Qtrs.

62.14B Beginning Squash Racquets

1 Q.H.*

Introduction to squash racquets at the beginning level; development of skills, rules strategy, and etiquette.

Staff

Fall and Winter Qtrs.

62.14C Beginning Tennis

1 Q.H.

Instruction in beginning tennis skills, rules, strategy, and care of equipment.

Staff

Spring and Summer Qtrs.

62.14D Indoor Tennis

1 Q.H.*

Introduction to tennis at the beginning level through the use of paddles and racquets in modified game situations; development of skill, rules, strategy and etiquette. (Does not fulfill skill requirement in Physical Education major curriculum.)

Staff

All Quarters

62.14E Intermediate/Advanced Badminton

(Prereq. 62.14A or equiv.) 1 Q.H.*

Instruction in badminton, including intermediate and advanced skills, with emphasis on singles and doubles match play and strategy.

Staff

Spring Qtr

62.14G Intermediate/Advanced Tennis

(Prereq. 62.14C or equivalent) 1 Q.H.*

Instruction in tennis, including intermediate and advanced skills, with emphasis on singles and doubles match play and strategy.

Staff

Summer Qtr

62.15A Fundamentals of Movement

1 Q.H.*

Understanding and performance of basic motor and sports. Efficient and effective movement for sports activities and daily living is stressed.

Staff

Fall Qtr

62.15B Beginning Archery

1 Q.H.*

Selected skills in target shooting and practical experience in archery games, novelty events and conduct of tournaments.

Staff

All Quarters

62.15D Beginning Bowling

1 Q.H.*

Development of knowledge and skill necessary for competent performance in bowling at the beginning level. Practice provided in nearby commercial alleys. *Lab. fee.*

Staff

All Quarters

62.15F Beginning Golf

1 Q.H.*

Instruction in fundamental golf skills, knowledge of clubs and their uses, and rules and etiquette. Indoor only during winter season.

Staff

All Quarters

62.15G Intermediate/Advanced Golf

(Prereq. 62.15F or equiv.) 1 Q.H.*

Instruction in golf at the intermediate-advanced level. Emphasis is placed on course play,

*Including lab.

rules, and selection of equipment. *Lab. fee.*

Staff

Fall and Summer Qtrs.

62.15H Beginning Judo

1 Q.H.*

A survey of the principles and fundamental skills of judo. Instruction is geared to the beginning and intermediate levels.

Staff

All Quarters

62.15J Beginning Boxing

(Prereq. men only) 1 Q.H.*

Instruction in boxing at the beginning level; emphasis on offensive and defensive techniques, scoring, training, and officiating.

Staff

All Quarters

62.15K Beginning Wrestling

(Prereq. men only) 1 Q.H.*

Beginning level of instruction in basic wrestling maneuvers. Stress on fundamental breakdowns, escapes, takedown, rides, and pinning combinations. Rules and scoring procedures discussed and modified matches conducted.

Staff

All Quarters

62.15L Intermediate/Advanced Wrestling

(Prereq. 62.15K or equiv.; men only) 1 Q.H.*

Intermediate-advanced levels of instruction presented. Emphasis is placed on training and training principles; selected skills not covered in beginning wrestling, scrimmages, and officiating.

Staff

Fall and Winter Qtrs.

62.15M Beginning Fencing

1 Q.H.*

Instruction in basic foil fencing, including introduction to competition.

Staff

Spring Qtr.

62.15N Intermediate/Advanced Foil Fencing

(Prereq. 62.15M or equiv.; women only) 1 Q.H.*

Instruction in intermediate-advanced techniques of foil fencing, with special emphasis on competition, judging, and the use of electrical equipment.

Staff

Spring Qtr.

62.15P Intermediate/Advanced Fencing (3 weapons)

(Prereq. 62.15M or equiv.; men only) 1 Q.H.*

Instruction in intermediate-advanced techniques of foil, epee, and sabre fencing, with special emphasis on competition, judging, and the use of electrical equipment.

Staff

Spring Qtr.

62.16B Weight Training

(Prereq. men only) 1 Q.H.*

Introduction to the principles and use of resistive exercises; isotonic exercise (weights), isometric, and the appropriateness of each.

Staff

Fall, Winter, and Spring Qtrs.

62.16C Physical Conditioning

1 Q.H.*

Instruction in basic exercise and conditioning techniques. Special emphasis on individual needs for exercise and activity. The relationships of diet and relaxation to exercise are discussed.

Staff

All Quarters

62.16D Exercise and Figure Control

(Prereq. women only) 1 Q.H.*

Instruction and guidance in contouring, fitness, and poise. (Does not fulfill skill requirement in Physical Education major curriculum.)

Staff

All Quarters

62.16E Adapted Physical Education I

(Prereq. medical consent) 1 Q.H.*

A course designed for students whose physical activity program must be modified for medical reasons. Personalized instruction and programs are provided according to individual needs.

Staff

All Quarters

*Including lab.

62.16G Principles of Physical Activities and Conditioning

2 Q.H.*

Survey of the physiological principles, concepts, and applications of skills concerned with individual or group fitness programs. (Not open to Physical Education majors.)

Staff

All Quarters

62.16H Ski Conditioning

1 Q.H.*

Instruction in skills and techniques for the development of strength, endurance, flexibility, and efficient use of body for skiing. (Does not fulfill skill requirement in Physical Education major curriculum.)

Staff

Fall and Winter Qtrs.

62.16J Beginning Skiing and Winter Sports

2 Q.H.*

Instruction in fundamental techniques of skiing, skating, and tobogganing. *Lab. fee.*

Staff

Winter Qtr.

62.16K Intermediate/Advanced Skiing and Winter Sports

(Prereq. 62.16J or equiv.) 2 Q.H.*

Instruction in skiing and skating at the intermediate-advanced level. Emphasis placed on skills, teaching, techniques, and safety procedures. *Lab. fee.*

Staff

Winter Qtr.

62.16L Beginning Track and Field

1 Q.H.*

Instruction in the fundamental skills in the various track and field events.

Staff

Spring Qtr.

62.16M Intermediate/Advanced Track and Field

(Prereq. 62.16L or equiv.) 1 Q.H.*

Instruction in intermediate-advanced techniques in track and field events. Emphasis is placed on improvement of individual skills; techniques of officiating are discussed.

Staff

Spring and Summer Qtrs.

62.16P Beginning Handball

(Prereq. men only) 1 Q.H.*

Development of knowledge and skills necessary for competent performance in handball at the beginning level.

Staff

Fall and Winter Qtrs.

62.16Q Intermediate/Advanced Handball

(Prereq. 62.16P or equiv.; men only) 1 Q.H.*

Development of knowledge and skills necessary for competent performance in handball at the intermediate to advanced levels.

Staff

Winter Qtr.

62.17C Beginning Basketball

1 Q.H.*

Development of knowledge and skills necessary for performance in basketball at the beginning level.

Staff

Fall and Winter Qtrs.

62.17D Intermediate/Advanced Basketball

(Prereq. 62.17C or equiv.) 1 Q.H.*

Development of knowledge and skills necessary for performance in basketball at the intermediate to advanced levels.

Staff

Fall and Winter Qtrs.

62.17F Beginning Ice Hockey

(Prereq. consent of instructor) 1 Q.H.*

Development of knowledge and skills necessary for performance in ice hockey at the beginning levels. Candidates must be able to skate forward and backward and cut right and left for admission.

Staff

Fall and Winter Qtrs.

62.17G Intermediate/Advanced Ice Hockey (Prereq. 62.17F or equiv.; men only) 1 Q.H.*

Development of knowledge and skills necessary for performance in ice hockey at the intermediate to advanced levels.

Staff

Fall and Winter Qtrs.

*Including lab.

- 62.17J Beginning Volleyball** 1 Q.H.*
Development of knowledge and skill for performance in volleyball at the beginning level.
Staff Fall and Winter Qtrs.
- 62.17K Intermediate/Advanced Volleyball** (Prereq. 62.17J or equiv.) 1 Q.H.*
Development of knowledge and skill for performance in volleyball at the intermediate to advanced levels.
Staff Fall and Winter Qtrs.
- 62.17L Beginning Field Hockey** (Prereq. women only) 1 Q.H.*
Development of knowledge and skill for competent performance in field hockey at the beginning level.
Staff Fall and Winter Qtrs.
- 62.17M Intermediate Field Hockey** (Prereq. 62.17L or equiv.; women only) 1 Q.H.*
Development of knowledge and skill for competent performance in field hockey at the intermediate to advanced levels.
Staff Fall and Winter Qtrs.
- 62.17N Flag Football** (Prereq. men only) 1 Q.H.*
Development of fundamentals of football through noncontact work at the beginning level.
Position play, passing, catching, running.
Staff Fall and Winter Qtrs.
- 62.17P Beginning Football** (Prereq. men only) 1 Q.H.*
Development of fundamental football skills and knowledge to the beginning level of competence.
Staff Fall and Winter Qtrs.
- 62.17Q Intermediate/Advanced Football** (Prereq. 62.17P or equiv.; men only) 1 Q.H.*
Development of football knowledge and skill necessary for competent performance in football at the intermediate to advanced levels.
Staff Fall and Winter Qtrs.
- 62.18C Beginning Softball** 1 Q.H.*
Development of knowledge and skill necessary for competent performance in softball at the beginning level.
Staff Spring and Summer Qtrs.
- 62.18D Intermediate/Advanced Softball** (Prereq. 62.18C; women only) 1 Q.H.*
Development of knowledge and skill necessary for competent performance in softball at the intermediate to advanced level.
Staff Spring and Summer Qtrs.
- 62.18E Baseball** (Prereq. 62.18C or equivalent; men only) 1 Q.H.*
Development of knowledge and skill necessary for competent performance in baseball at the intermediate to advanced levels.
Staff Spring and Summer Qtrs.
- 62.18G Beginning Lacrosse** (Prereq. women only) 1 Q.H.*
Development of knowledge and skill necessary for competent performance in lacrosse at the beginning level.
Staff Spring and Summer Qtrs.
- 62.18H Intermediate/Advanced Lacrosse** (Prereq. 62.18G or equiv.; women only) 1 Q.H.*
Development of knowledge and skill necessary for competent performance in lacrosse at the intermediate to advanced levels.
Staff Spring and Summer Qtrs.
- 62.18J Beginning Lacrosse** (Prereq. men only) 1 Q.H.*
Development of knowledge and skill necessary for competent performance in lacrosse at the beginning level, including lab.

beginning level.

Staff

Spring and Summer Qtrs

62.18K Intermediate/Advanced Lacrosse (Prereq. 62.18J or equiv.; men only) 1 Q.H.*

Development of knowledge and skill necessary for competent performance in lacrosse at the intermediate to advanced levels.

Staff

Spring and Summer Qtrs

62.18M Beginning Soccer

(Prereq. women only) 1 Q.H.*

Development of knowledge and skill necessary for competent performance in soccer at the beginning level.

Staff

Spring and Summer Qtrs

62.18N Intermediate/Advanced Soccer (Prereq. 62.18M or equiv.; women only) 1 Q.H.*

Development of knowledge and skill necessary for competent performance in soccer at the intermediate to advanced levels.

Staff

Spring and Summer Qtrs

62.18Q Beginning Soccer

(Prereq. men only) 1 Q.H.*

Development of knowledge and skill necessary for competent performance in soccer at the beginning level.

Staff

Spring and Summer Qtrs

62.18R Intermediate/Advanced Soccer (Prereq. 62.18Q or equiv.; men only) 1 Q.H.*

Development of knowledge and skill necessary for competent performance in soccer at the intermediate to advanced levels.

Staff

Spring and Summer Qtrs

62.18T Selected Field Sports

(Prereq. women only) 1 Q.H.

Development of knowledge and skill in speedball, speedaway, and flag football.

Staff

Spring and Summer Qtrs

62.18V Selected Field Sports

(Prereq. men only) 1 Q.H.

Development of knowledge and skill in speedball and speedaway.

Staff

Spring and Summer Qtrs

62.19A Early Childhood Motor Skill Development

2 Q.H.

A study of the development of fundamental motor patterns (run, catch, kick, strike, jump throw) from age 0 to 10 years, including perceptual motor organizations of vision, audition and proprioception.

Staff

Fall and Winter Qtrs

62.19B Games and Activities for Children

2 Q.H.

Introduction to simple ball games, running and tag games, self-testing activities, movement exploration, and rhythms appropriate for children. Course content appropriate for future parents, teachers, and youth leaders.

Staff

Fall and Winter Qtrs

62.19D The Spectator and Sports (Pass/Fail)

1 Q.H.

Instruction in the understanding for enjoyment as a spectator of such sports as football, basketball, ice hockey.

Staff

All Quarters

62.19G Perceptual Motor Training Programs

2 Q.H.*

An introduction to the role motor activities play in enhancing perceptual development. An examination of some current training programs: Frostig, Kephart, Doman-Delacato, Winter-Haven.

Staff

Spring Qtr

62.201 Human Movement

4 Q.H.*

An introduction to the nature and role of human movement and the analysis of skillful

*Including lab.

movement performance through participation and observation. Introduction to the objectives, literature, and organization of the profession of physical education.

Staff Fall Qtr.

62.203 Practicum in Group Dynamics (Prereq. 62.201) 4 Q.H.

A three-week residence group living experience at the Warren Center. An introduction in group dynamics through selected activities, discussion, living and working together.

Staff Spring Qtr.

62.204 Psychology of Sport (Prereq. consent of instructor) 2 Q.H.

The psychological analysis of behavioral patterns and interactions in individual and team sports; includes personality and motivation, competition and sportsmanship, the role of spectators.

Staff Spring Qtr.

62.206 First Aid 2 Q.H.*

First Aid procedures recommended for the home, school, and community. Emphasis on practices endorsed by the American Red Cross.

Staff Spring Qtr.

62.208 Sociology of Sport and Dance (Prereq. consent of instructor) 2 Q.H.

The study of sport and dance as a social institution, including theories explaining the role of each in contemporary society, and the part of each in evolving societies.

Staff Spring and Summer Qtrs.

62.210 History and Principles of Physical Education 4 Q.H.

Preview of history of physical education; the place and function of physical education in society; identification of principles for development of sound programs.

Staff Fall and Winter Qtrs.

62.212 Theory of Coaching (Prereq. consent of instructor) 2 Q.H.

An analysis of learning principles, sociology, and psychology as applied to the coaching of individual, dual, and team sports. Techniques and standards of squad recruitment, organization, leadership, and coaching ethics are presented.

Staff Fall and Winter Qtrs.

62.215 Observation of Student Behavior 2 Q.H.*

The growth and development of elementary children and adolescents in physical education through direct observations and laboratory work with children.

Staff Spring Qtr.

62.217 Theory of Play 2 Q.H.

The nature of play and a study of cross-cultural patterns of play. An investigation of selected theories of play, including Huizinga, Caillois, Sutton-Smith, and Lee.

Staff Fall and Winter Qtrs.

62.218 Elementary School Activities I (Prereq. 50.121) 4 Q.H.*

The development of knowledge and skill beyond the advanced beginning level in the following activities for elementary school children: dance, gymnastics, movement education, low organization games, lead-up games, and aquatics. Analysis of elementary school children's performance and appropriate teaching techniques for the elementary school are observed and applied through observations and laboratory experience.

Staff Spring and Summer Qtrs.

62.221 Perceptual-Motor Learning and Development (Prereq. 50.121) 3 Q.H.

Interrelationships of movement behavior and perceptual-motor organizations of vision, audition, proprioception, and psycho-social effects of perception. A brief overview of major theories of learning as they apply to learning motor skills.

Staff Fall and Winter Qtrs.

*Including lab.

62.24A Coaching Competitive Swimming

(Prereq. 62.10B or consent of instructor) 2 Q.H.*

Instruction in the techniques, theory, and coaching methods of competitive swimming and diving.

Staff

Winter Qtr.

62.24B Swimming Analysis

(Prereq. 62.10B or consent of instructor) 2 Q.H.*

Instruction in theory, analysis techniques, and teaching methods in swimming.

Staff

All Quarters

62.24C Smallcraft Analysis

(Prereq. 62.10Q) 2 Q.H.*

Instruction in techniques, theory, and teaching methods of small craft classes. Red Cross certification possible.

Staff

Summer Qtr.

62.24E Analysis and Coaching of Men's Gymnastics

(Prereq. 62.13T) 2 Q.H.*

Skill analysis and coaching of men's gymnastics, with emphasis on appropriate teaching methods, new trends, and judging.

Staff

Fall and Winter Qtrs.

62.24F Analysis and Coaching of Women's Gymnastics

(Prereq. 62.13S) 2 Q.H.*

Skill analysis and coaching of women's gymnastics, with emphasis on appropriate teaching methods and new trends.

Staff

Fall and Winter Qtrs.

62.24G Advanced Analysis and Judging of Women's Gymnastics

(Prereq. 62.13P or R) 2 Q.H.*

Advanced skill analysis techniques and instruction in judging women's gymnastics leading toward a judging certification.

Staff

Winter and Spring Qtrs.

62.24H Analysis and Coaching of Badminton

(Prereq. 62.14E) 2 Q.H.*

Analysis of performance and methods of teaching and coaching in badminton.

Staff

Spring and Summer Qtrs.

62.24J Analysis and Coaching of Tennis

(Prereq. 62.14G) 2Q.H.*

Analysis of performance and methods of teaching and coaching in tennis.

Staff

Spring and Summer Qtrs.

62.24K Analysis and Coaching of Fencing

(Prereq. 62.15N or 62.15P) 2 Q.H.*

Advanced skill analysis and coaching of fencing. Special emphasis on current research and teaching methods of fencing.

Staff

Winter and Spring Qtrs.

62.24L Analysis and Coaching of Golf

(Prereq. 62.15G or equivalent) 2 Q.H.*

Advanced skill analysis and coaching of golf. Special emphasis on course play and teaching methods. *Lab. fee.*

Staff

Fall, Spring, and Summer Qtrs.

62.24M Analysis and Coaching of Track and Field

(Prereq. 62.16M or equiv.) 2 Q.H.*

Advanced skill analysis and coaching of all track and field skills. Special emphasis placed on the analysis of common movement patterns, teaching methods, and coaching techniques for the individual performer.

Staff

Spring and Summer Qtrs.

62.24N Analysis and Coaching of Wrestling (Prereq. 62.15L or equiv.; men only) 2 Q.H.*

Analysis of performance and techniques of teaching selected wrestling skills are covered in detail. Application of research to methodology is stressed.

Staff

Fall and Winter Qtrs.

62.24P Analysis and Coaching of Baseball

(Prereq. 62.18E) 2 Q.H.*

The basic techniques and responsibilities of coaching interscholastic and intercollegiate

*Including lab.

baseball; to include advanced skill analysis, position and team play, conditioning, practice organization, and team management.
Staff Fall and Spring Qtrs.

62.24Q Analysis and Coaching of Basketball (Prereq. 62.17C) 2 Q.H.*
The basic techniques and responsibilities of coaching interscholastic and intercollegiate basketball; to include advanced skill analysis, position and team play, conditioning, practice organization, and team management.
Staff Fall and Winter Qtrs.

62.24R Analysis and Coaching of Field Hockey (Prereq. 62.17K; women only) 2 Q.H.*
The basic techniques and responsibilities of coaching intramural, interscholastic, and intercollegiate field hockey; to include advanced skill analysis, position, and team play, conditioning, practice organization, and team management.
Staff Fall and Spring Qtrs.

62.24S Analysis and Coaching of Football (Prereq. 62.17Q; men only) 2 Q.H.*
The basic techniques and responsibilities of coaching interscholastic and intercollegiate football; to include advanced skill analysis, team conditioning, offensive and defensive systems, practice organization, team management, and coaching staff organization.
Staff Fall and Spring Qtrs.

62.24U Analysis and Coaching of Ice Hockey (Prereq. 62.17G; men only) 2 Q.H.*
The basic techniques and responsibilities of coaching interscholastic and intercollegiate ice hockey; to include advanced skill analysis, position and team play, conditioning, practice organization, and team management.
Staff Winter Qtr.

62.24V Analysis and Coaching of Lacrosse (Prereq. 62.18A or 62.18K) 2 Q.H.*
The basic techniques and responsibilities of coaching intramural, interscholastic, and intercollegiate lacrosse; to include advanced skill analysis, position and team play, conditioning, practice organization, and team management.
Staff Spring and Summer Qtrs.

62.24W Analysis and Coaching of Soccer (Prereq. 62.18N or 62.18R) 2 Q.H.*
The basic techniques and responsibilities of coaching intramural, interscholastic, and intercollegiate soccer; to include advanced skill analysis, position and team play, conditioning, practice organization, and team management.
Staff Spring and Summer Qtrs.

62.24X Analysis and Coaching of Softball (Prereq. 62.18D; women only) 2 Q.H.*
The basic techniques and responsibilities of coaching intramural, interscholastic, and intercollegiate softball; to include advanced skill analysis, management.
Staff Spring and Summer Qtrs.

62.24Y Analysis and Coaching of Volleyball (Prereq. 62.17J) 2 Q.H.*
The basic techniques and responsibilities of coaching intramural, interscholastic, and intercollegiate volleyball; to include advanced skill analysis, position and team play, conditioning, practice organization, and team management.
Staff Fall and Winter Qtrs.

62.249 Physical Science Foundations 3 Q.H.*
A treatment of basic concepts and fundamentals of chemistry and physics as applied to human physiology and movement.
Staff Spring Qtr.

62.250 Anatomy and Physiology I 4 Q.H.*
Gross anatomy and physiology of the human skeletal, joint, and muscular systems.
Staff Fall and Winter Qtrs.

62.251 Anatomy and Physiology II (Prereq. 62.250 or consent of instructor) 4 Q.H.*
Gross anatomy and physiology of the human nervous and circulatory systems.
Staff Spring and Summer Qtrs.

- 62.252 Anatomy and Physiology III** (Prereq. 62.251 or consent of instructor) 4 Q.H.*
Gross anatomy and physiology of the human endocrine, respiratory, digestive, and urinary systems.
Staff Fall and Winter Qtrs.
- 62.253 Kinesiology** (Prereq. 62.250 or equiv.) 4 Q.H.*
Science of human motion and anatomic and mechanical principles as they relate to an understanding of skillful, efficient, and purposeful human motion. Introduction to cinematographic analysis.
Staff Fall, Winter, and Spring Qtrs.
- 62.254 Exercise Physiology** (Prereq. 62.253) 4 Q.H.*
Study of the immediate and long-range effects of exercise upon the human body, with emphasis on muscles, circulation, respiration, and metabolism; the scientific foundations of physical fitness; survey of related research.
Staff Fall, Winter, and Summer Qtrs.
- 62.255 Adapted Physical Education** (Prereq. 62.252 or equiv.) 4 Q.H.*
Study of disabilities which prevent participation in unrestricted physical education programs. Selection and modification of physical activities to meet individual needs.
Staff Fall, Winter, and Summer Qtrs.
- 62.256 Athletic Training and Conditioning** 3 Q.H.*
The training and conditioning procedures in athletic programs; special emphasis on the prevention of athletic injuries; role of the trainer, athlete, coach, and health service.
Staff Fall, Winter, and Summer Qtrs.
- 62.257 Advanced Athletic Training** (Prereq. 62.256) 4 Q.H.*
The advanced preparation and utilization of programs of conditioning and administration for prevention and care of injuries associated with competitive athletics.
Staff Fall and Winter Qtrs.
- 62.260 Measurement and Evaluation** 4 Q.H.
Construction, use, selection, and interpretation of evaluative tools applicable to physical education; elementary statistical methods.
Staff Fall and Winter Qtrs.
- 62.270 Administration of Physical Education** (Prereq. 62.210) 4 Q.H.
The organization and administration of programs in physical education, with emphasis on the elementary and secondary school program.
Staff Spring Qtr.
- 62.273 Sports Officiating** (Prereq. women only) 2 Q.H.*
Theory, practice, and techniques of officiating. (choices of: basketball, volleyball, softball, soccer, field hockey, lacrosse).
Staff All Quarters
- 62.274 Sports Officiating** (Prereq. women only) 2 Q.H.
Theory, practice, and techniques of officiating (choices of: basketball, volleyball, softball soccer, field hockey, lacrosse).
Staff All Quarters
- 62.275 Critical Teaching Skills** 3 Q.H.
Experience using the taxonomies of educational objectives to write, conduct, and evaluate educational and behavioral objectives. Analysis of direct and indirect, verbal and nonverbal teaching behavior for classroom and activity teaching to be studied by micro-teaching, simulation, and interaction analysis techniques.
Staff Fall and Winter Qtrs.
- 62.277 Outdoor Teaching Lab** 2 Q.H.
A three-week resident summer practicum at the Warren Center. Provides opportunities for

*Including lab.

assumption of counseling, teaching, and leadership roles in special camp programs, land sports, nature, pioneering, arts and crafts, and aquatics. Youngsters of various ages from the Boston area are assigned in residence as subject campers.

Staff

Summer Qtr.

62.279 College Teaching Experience (Pass/Fail)

(Prereq. seniors with consent of instructor) 1 Q.H.*

Experience in teaching physical education at the college level. Achieved by assisting and teaching in University classes supervised by a member of the college faculty.

Staff

All Quarters

62.280 Curriculum Development

(Prereq. 62.275 or consent of instructor) 3 Q.H.

Basic foundations of curriculum development stressing fundamental principles and guides to curriculum organization, format, and evaluation. Survey of existing curricula and the development of an understanding of current curriculum trends.

Staff

Spring Qtr.

62.282 Supervised Student Teaching

12 Q.H.

Assignment to public school(s) for observation and practice teaching under the guidance of a cooperating teacher and a college supervisor. Association with the main duties assumed by physical education teachers, including coaching and/or intramural organization and supervision. Individual conferences and seminars.

Staff

Fall and Winter Qtrs.

62.283 Modern Dance Composition

(Prereq. 62.12G or consent of instructor) 3 Q.H.*

An analysis of dance composition, with practice in choreography for solo, duet, and trio.

Staff

Spring Qtr.

62.284 Dance History and Philosophy

4 Q.H.

A survey of dance from ancient times to the present. Consideration of dance as an art form in relation to other art forms and of dance as an educational discipline.

Staff

Spring Qtr.

62.286 Dance: Choreography and Production

4 Q.H.*

Choreography for trio, quartet, and large groups based upon the projection of an idea or mood. Theory and practice in the staging of student choreography, including lighting, costuming, scenery, and makeup.

Staff

Winter Qtr.

62.288 Recreational Dance

(Prereq. 62.12B or equiv.) 2 Q.H.*

Theory and practice of the methods and materials in the teaching of recreational dance forms at the primary and secondary levels.

Staff

Spring Qtr.

62.289 Creative Dance I

(Prereq. 62.12F or equiv.) 2 Q.H.*

Theory and practice of methods and materials in the teaching of creative dance to elementary school children. Examination of the aims and responsibilities of dance education at the primary level.

Staff

All Quarters

62.290 Creative Dance II

(Prereq. 62.12F or equiv.) 2 Q.H.*

Theory and practice of methods and materials in the teaching of creative dance to secondary school children. Examination of the aims and responsibilities of dance education at the secondary level.

Staff

All Quarters

62.291, 62.292, 62.293 Special Problems

(Prereq. consent of Dept. chairman) 2, 3, or 4 Q.H.

Independent investigation of physical education in an area of each student's interests. The investigation will be supervised by an appointed faculty member and will culminate in a formal written report.

Staff

All Quarters

Recreation Education

63.120 Orientation to Recreation

1 Q. H.

A general orientation to the entire field of recreation and its role in society. Exposure to background, goals, philosophy, leadership, and programs in various settings. Orientation to the curriculum, the three-track system, and career opportunities.

Prof. Robinson

Fall Qtr.

63.121 Recreation Skills I

3 Q.H.*

Skill development, participation, and leadership in the following selected recreational activities: social recreation, volleyball, and badminton and music (introduction to guitar).

Prof. Hache' and Ms. Dawson

Fall Qtr.

63.122 Recreation Skills II

4 Q.H.*

Skill development, appreciation, participation, and leadership in tumbling and gymnastics, folk dance, music (introduction to guitar), and basic Red Cross swimming.

Prof. Hache and Ms. Dawson

Winter Qtr.

63.123 Recreation Skills III

4 Q.H.*

Development of leadership skill in social recreation activities: music, folk dance, games, and party program planning, including leadership experience with groups. Counselor education, philosophy, and leadership methods in camping. Red Cross life saving course.

Prof. Hache' and Ms. Dawson

Spring Qtr.

63.125 Outdoor Education and Camp Leadership

4 Q.H.

A two-week resident summer session at Warren Center: includes natural science, aquatics, overnight camping, Indian lore, ACA campcraft certification, leadership in special camp programs, outdoor sports, and small craft training.

Prof. Eliopoulos and Staff

Summer Qtr.

63.126 Outdoor Education I

3 Q.H.*

Interpretation of natural science and ecology. Emphasis on the development of personal skills through laboratory, field trips, lectures, and learning experiences in the out-of-doors.

Prof. Jeffrey and Staff

Fall and Winter Qtr.

63.127 Outdoor Education II

3 Q.H.*

Emphasis in developing understanding, interest, and field biology skills for ecology, conservation, and recreation.

Ms. Dawson

Spring and Summer Qtr.

63.128 Survey of Outdoor Recreation and Park Facilities

3 Q.H.

Fundamental management and administration concepts for a wide variety of outdoor areas and facilities such as parks, beaches, ice rinks, marinas, and camps.

Ms. Dawson

Spring and Winter Qtrs.

63.129 School Camping - Organization and Administration

3 Q.H.

Administration and leadership in school outdoor education and conservation programs in the natural environment. Field trips and laboratory include experience with school-age groups.

Prof. Jeffrey and Staff

Spring Qtr.

63.133 Recreation Skills IV

3 Q.H.*

Development of skills and teaching techniques in both men's and women's basketball. Techniques of teaching volleyball and badminton. Survey of recreational swimming skills, including participation. Techniques of leadership in aquatics games, competitive swimming, diving, skin diving, and synchronized swimming.

Ms. Dawson

Fall and Winter Qtrs.

63.134 Recreation Skills V

3 Q.H.

Techniques of teaching tennis and gymnastics, Red Cross standard and advanced first aid.

Ms. Dawson

Spring and Winter Qtrs.

*Including lab.

- 63.135 Social Recreation** 2 Q.H.
Techniques of leadership, participation, and planning for recreation in social settings for all ages and typical and atypical groups: parties, programs, special events. Repertoire: mixers, dances, games, crafts, and music activities.
Prof. Eliopoulos Spring Qtr.
- 63.143 Winter Sports** 1 Q.H.
Five-day resident session. Instruction and practice in Alpine and Nordic skiing (downhill and touring), snow shoeing, winter mountain hiking, winter camping skills; optional overnight campout as well as environmental observations in the winter season. Fee charged for room and board. Equipment rented as needed.
Prof. Eliopoulos Winter Qtr.
- 63.146 Camp Administration** 3 Q.H.
Major problems involved in the establishment and operation of organized camps, including school, summer, and day camps. Selection of camp sites: sanitation, program, schedule, training personnel, finances, good management, and promotion.
Prof. Jeffrey Fall and Winter Qtr.
- 63.147 Outdoor Education for Handicapped** 3 Q.H.
Technical training and experience with atypical individuals. Recreation and education for exceptional and handicapped age groups.
Prof. Sayed Spring Qtr.
- 63.148 Introduction to Mountaineering** 4 Q.H.
All aspects of mountaineering, exposing students to the physical, emotional, and intellectual challenges afforded by technical mountaineering. An interdisciplinary study drawing upon social, physical, and natural sciences: i.e., physical, political and economic geography, glaciology, meteorology, structural geology, physiology, and social psychology. Basic skills are developed in friction and technical climbing, route finding, navigation, expedition planning, and wilderness living. The course includes a technical rock-climbing laboratory, and a two-day mini-expedition in the Northern Presidential Range.
Not offered 1973-74
- 63.150 Anatomy and Physiology I** 3 Q.H.*
Gross anatomy and physiology of the human skeletal, articular, muscular, and nervous systems. Implications for recreation programs.
Prof. Sayed Fall and Winter Qtrs.
- 63.151 Anatomy and Physiology II** 3 Q.H.*
Gross anatomy and physiology of the human endocrine, circulatory, respiratory, digestive, and urinary systems. Implications for recreation programs.
Prof. Sayed Spring and Summer Qtrs.
- 63.160 Recreation Resources** 3 Q.H.
A study of practical use by recreation professionals of audiovisual, instructional, and computer technology.
Prof. Morrison Spring and Summer Qtrs.
- 63.210 Philosophy of Recreation** 3 Q.H.
A study of history, theories, concepts, attitudes of play, recreation, and leisure related to developing a personal philosophy. Viewpoints and input from other fields as they apply to recreation and leisure.
Prof. Robinson Fall and Winter Qtrs.
- 63.215 Trends and Issues in Recreation** 3 Q.H.
For nonmajors in Recreation. National and international issues and trends in the professional field; trends in participation with professional implications; emerging programs; legislation; the leader and the future.
Prof. McCay Spring Qtr.

63.220 Methods and Materials in Recreation

3 Q.H.

Program planning in recreation includes the study of the physical, social, and emotional characteristics and needs of all age groups, and the most appropriate recreational programs that meet the needs of these individuals and groups. Also includes programs for special occasions and evaluation of programs for improvement purposes. The role of leadership in developing and operating programs is discussed.

Prof. Sayed

Fall and Winter Qtr.

63.240 Dance and Cultures

3 Q.H.*

Learning and teaching folk dances; also cultural appreciation through dance, music, arts, crafts, customs, foods, dress, history, and traditions.

Prof. Eliopoulos

Fall and Winter Qtrs.

63.250 Group Dynamics

3 Q.H.

Designed for promoting an understanding of group processes and developing human relations skills. Major areas of concentration include: communications, leadership, decision making, and evaluation of the group process.

Prof. Eliopoulos

Fall and Winter Qtrs.

63.254 Introduction to Therapeutic Recreation Services

3 Q.H.

Understanding of the needs and attitudes of and toward people who are impaired, disabled, or handicapped. Study of the various disabling diseases and conditions, as well as the people in therapeutic recreation services.

Prof. Robinson

Fall and Winter Qtrs.

63.256 Recreation Activities for Atypical Individuals and Groups I

3 Q.H.

Adaptation of recreational activities to meet the needs of handicapped individuals in hospitals and other agencies offering recreational programs for handicapped. Emphasis on the basic principles of recreational therapy.

Prof. Eliopoulos

Fall and Winter Qtrs.

63.257 Recreation Activities for Atypical Individuals and Groups II

3 Q.H.

A continuation of 63.256 in adaptation of recreational activities to meet the needs of handicapped individuals. Includes observation of activities in therapeutic setting.

Prof. Eliopoulos

Spring Qtr.

63.260 Administration of Recreation and Parks

4 Q.H.

Administration procedures of tax-supported recreation and park operations. Concentration on legality, commissions, area and facility design. Also personnel policies and problem solving related to administration and management.

Prof. Robinson

Fall and Winter Qtrs.

63.262 Recreation and Budgeting and Financing

3 Q.H.

A study of the process of budget and finance planning in the field of recreation. Planning a short- or long-term budget, including budget evaluation and a study of financial policies of government and private agencies. Also procedures for bidding, purchasing, inventory, and others.

Profs. McCay and Morrison

Spring Qtr.

63.266 Recreation and Community Schools

3 Q.H.

The place of the school in community recreation. Special emphasis on the schools' 12-month program to meet the needs of all ages. Field programs dealing with the community school concept.

Prof. Sayed

Spring Qtr.

63.257 Introduction to Youth Groups

3 Q.H. *

Philosophy, history, and program of such various youth groups as YMCAs, YWCAs, and Boys' and Girls' Clubs. Visiting and evaluating programs of selected clubs and organizations; identification of service agencies in the United States; and comparative study of youth

*Including lab.

programs in different countries.

Prof. Sayed

Fall and Winter Qtrs.

63.270 Arts and Crafts

3 Q.H.*

Survey of selected handicraft arts: sketching, acrylic painting, paper sculpture, wood carving, decoupage, printing, weaving, macrame and batik, and selected independent study. Emphasis on acquisition of fundamental skills, experimentation, and preparation for teaching.

Ms. Dawson

Fall and Winter Qtrs.

63.280 Supervised Field Experience and Teaching

16 Q.H.

Comparable to student teaching in education. Professional assignment in recreation setting; i.e., industry, center, school, hospital, agency, organization, housing, settlement, park playground, camp. Supervision and conferences; seminar.

Prof. McCay and Jeffrey

Spring and Summer Qtrs.

63.285 Introduction to Research

4 Q.H.

A study of empirical research procedures, including: planning the study, sampling, designing instrumentation, gathering and analyzing data. Students write a research proposal, simulate response data, and analyze such data through use of computer-based statistical packages.

Prof. Morrison

Fall and Winter Qtrs.

63.290 Research Seminar

Students design and carry out individual or collaborative research projects under close faculty supervision. Each student is encouraged to use the proposal developed in 63.285 (Introduction to Research) as a basis for such a project. A written report of research findings is required.

Prof. Morrison

Spring Qtr.

Physical Therapy

64.111 Introduction to Physical Therapy

1 Q.H.*

Orientation to the field of physical therapy and its role in the health professions.

Miss Cardinali and Miss Foster

Winter Qtr.

64.113 Introduction to Physical Therapy

(Prereq. 64.111) 2 Q.H.*

Theory and practice in applied body mechanics and basic procedures relating to patient management.

Miss Foster and Mrs. Leventhal

Spring Qtr.

64.115 Introduction to Physical Therapy

(Prereq. 64.113) 2 Q.H.*

Practice in the preparation of patients and equipment for various treatment procedures. Introduction to ambulation and safety procedures. Theory, demonstration, and practice in hydrotherapy.

Miss Cardinali, Miss Foster, Mrs. Leventhal, Miss Sloop, and Staff

Spring and Summer Qtrs.

64.121 Gross Anatomy

(Prereq. 18.126, 18.148, 64.115) 5 Q.H.*

The structure and functions of the human body, with particular emphasis on the skeletal, muscular, and nervous systems. Lecture and laboratory with dissection.

Prof. Powers and Staff

Fall and Winter Qtrs.

64.131 Applied Anatomy

(Prereq. 11.172, 18.126, 18.148, 64.115) 5 Q.H.*

A further study of neuromuscular function, with emphasis on the mechanical and physiological factors involved; application to normal and pathological movement; physiology of exercise.

Miss MacFarlane and Staff

Fall and Winter Qtrs.

Including lab.

64.144 Physical Therapy I

(Prereq. 11.172, 18.126, 18.148, 64.115) 4 Q.H.

Theory, demonstration, and practice in massage; heat and light.

Miss Foster, Mrs. Leventhal and Staff

Fall and Winter Qtrs

64.145 Physical Therapy II

(Prereq. 64.121, 64.131, 64.144) 4 Q.H.

Theory, demonstration, and practice in evaluation procedures and analysis of functional activities.

Prof. Cerasoli, Miss Cardinali, Mrs. Leventhal, and Mrs. Williams

Spring and Summer Qtrs

64.146 Physical Therapy III

(Prereq. 64.121, 64.131, 64.144) 4 Q.H.

Theory, demonstration and practice in basic therapeutic exercise.

Prof. Van Slyck, Miss Cardinali, and Staff

Spring and Summer Qtrs

64.156 Physical Therapy IV

(Prereq. 64.145, 64.146) 4 Q.H.

Theory, demonstration, and practice in prosthetics and orthotics; physical therapy management of medical and surgical chest disorders.

Prof. Van Slyck, Prof. Cerasoli, Miss Foster, and Mrs. Williams

Fall and Winter Qtrs

64.157 Physical Therapy V

(Prereq. 64.145, 64.146) 3 Q.H.

Theory, demonstration, and practice in electrical muscle stimulation and testing procedures.

Prof. Shaffer, Miss Sloop, and Staff

Fall and Winter Qtrs

64.158 Physical Therapy VI

(Prereq. 64.156, 64.157) 4 Q.H.

Theory, demonstration, and practice in advanced therapeutic exercise.

Prof. Van Slyck, Prof. Cerasoli and Staff

Spring and Summer Qtrs

64.159 Clinical Seminar

(Prereq. 64.156, 64.157) 3 Q.H.

Selected topics related to clinical aspects in physical therapy. Interpersonal relationships, ethics, and teaching methods.

Prof. Shaffer and Cerasoli

Spring and Summer Qtrs

64.165 Professional Literature and Research

(Prereq. 64.158, 64.159) 2 Q.H.

Professional literature through Journal Club; introduction to scientific methodology and preparation of an independent research proposal.

Prof. Cerasoli and Staff

Fall and Winter Qtrs

64.173 Rehabilitation

(Prereq. 64.186) 2 Q.H.

Concepts of rehabilitation and community health presented by allied health personnel. Emphasis on the role of the physical therapist as a member of the health team. Class discussion and seminar.

Mrs. Leventhal

Spring Qtr

64.176 Administration

(Prereq. 64.186) 3 Q.H.

Principles and methods in administrative responsibilities, including supervision and consultation.

Prof. Carlisle and Mrs. Leventhal

Spring Qtr

64.186 Supervised Clinical Education

(Prereq. professional cumulative average of 2.0) 8 Q.H.

Advanced clinical experience (full time), providing the student with opportunities to practice various phases of physical therapy under supervision in preparation for assuming the role of a qualified physical therapist.

Prof. Shaffer, Cerasoli, and Staff

Fall and Winter Qtrs

64.210 Pathology

(Prereq. 18.126, 18.148) 3 Q.H.

Lectures and demonstrations of pathological and gross specimens. Inflammation, repair, infection, immunity and hypersensitivity, degenerative processes, disturbances of metabolism and circulation; disorders of growth, including tumors.

Gherardo J. Gherardi, M.D.

Fall and Winter Qtrs

64.220 Clinical Medicine I

(Prereq. 18.126, 18.148) 2 Q.H.

Lectures covering the various areas of medicine and surgery related to conditions commonly

encountered in patients treated by the physical therapist. Pediatrics, general medicine, general surgery.

John W. Graef, M.D., and Sidney Koretsky, M.D.

Winter Qtr.

64.221 Clinical Medicine II (Prereq. 18.126, 18.148, 64.121, 64.210) 3 Q.H.

A continuation of Clinical Medicine 64.220. Orthopedic conditions, thoracic surgery, role of the laboratory.

Henry H. Banks, M.D., and Associates

Spring Qtr.

64.222 Clinical Medicine III (Prereq. 18.126, 18.148, 64.121, 64.210) 3 Q.H.

A continuation of Clinical Medicine 64.220. Clinical neurology and neurosurgery, plastic surgery, burns, dermatology, gynecology, urology.

John J. Sullivan, M.D., and Associates

Spring Qtr.

64.235 Psychiatry (Prereq. 19.102, 19.140) 3 Q.H.

Review of psychiatric categories, including consideration of etiology and treatment. Psychosocial variables significant in the management of patients with whom the physical therapist is concerned.

Fred Hinman, M.D.

Fall Qtr.

64.246 Applied Physiology (Prereq. 18.126, 64.165) 4 Q.H.*

Implementation of independent research proposals. Effect on the physiological processes of the body produced by basic treatment and testing procedures of physical therapy; modifications due to pathological changes. Patient presentation included.

March Enders, M.D., Prof. Cerasoli, and Staff

Fall and Winter Qtrs.

64.250 Neuroanatomy (Prereq. 64.121, 64.131) 3 Q.H.

Morphological and functional management of the nervous system; derangement of normal structure and function of the nervous system in various diseases. Lecture and laboratory with dissection.

Prof. Powers and Staff

Fall and Winter Qtrs.

School and Community Health Education

65.110 Foundations of Health Education 2 Q.H.

Orientation to school health education: introduction to the conceptual approach in health education, with emphasis on personal health and factors influencing health. Introduction to the philosophy of health education.

Staff

Fall Qtr.

65.114 Mental Health (Prereq. 19.102 or equiv.) 4 Q.H.

An investigation of mental illness and well-being as they relate to total health, with concern for the factors that influence mental and emotional behavior. Various approaches to mental health education in school programs included.

Miss Zaremba

Fall and Spring Qtrs.

65.116 Nutrition (Prereq. 12.102) 4 Q.H.

The principles of good selection, including knowledge of the basic nutrients, with emphasis on building and maintaining sound health. Nutritional problems, such as deficiency diseases, food fallacies and fads, and weight control, including various approaches to nutrition education in school programs.

Staff

Fall and Spring Qtrs.

65.118 Drug Use and Abuse 4 Q.H.

The use and abuse of modern drugs in our society, including prescription and nonprescription drugs, alcohol and tobacco, and their physiological and psychological effects on the body; the social problems surrounding drug abuse, including various approaches to drug education in school programs. (Open to all N.U. students.)

Miss Maguire

Fall and Winter Qtrs.

including lab.

65.129 Health Education

3 Q.H.

Principles of personal health; emphasis on information pertinent to mental and physical well-being, current social behavior, and effective approaches to college living.

Staff

Fall and Spring Qtrs.

65.130 Health Problems of the College Student

(Prereq. Physical Education Majors only) 3 Q.H.

Discussion of the major health problems affecting college students. Principles of personal health, with emphasis on healthful college living.

Staff

Spring Qtr.

65.140 Concepts in Health, Aging, and Longevity

4 Q.H.

Principles of the aging process and implications for diverse community, state, and national health programs.

Staff

Fall Qtr.

65.160 Instructional Resources

2 Q.H.

Survey of audiovisual media. Actual operation of selected types of equipment. Production of transparencies, felt boards, etc. Creative approaches stressed.

Staff

Winter Qtr.

65.207 First Aid, Safety, and Preventive Health Education

(Prereq. 65.110) 4 Q.H.

Personal habits and activities which may delay the aging process and/or preserve the homeostatic balance of the human being, with special attention to physical fitness, first aid, safety education, and other preventive health measures as they relate to total health.

Staff

Winter and Spring Qtrs.

65.215 School and Community Health

(Prereq. 65.129) 3 Q.H.

Focus on the teacher's all-important role in developing and relating the principles, patterns, and programs of school and community health education.

Staff

Summer Qtr.

65.216 Methods and Materials in Health Education

(Prereq. 65.129) 4 Q.H.

Materials appropriate to the teaching of health and safety in the elementary and secondary school; emphasis on direct unit instruction.

Staff

Winter Qtr.

65.217 Teaching Procedures/Curriculum in Health Education in School and Community

(Prereq. Motivation, 19.146, or equiv.) 4 Q.H.

Current methods, with study of new approaches to instruction in health education. Includes analysis of curriculum and the relationships among curricula and teaching methods.

Staff

Spring Qtr.

65.218 Public Health

3 Q.H.

Principles of public health, with particular emphasis on the emerging patterns of community organization and activities in the public health field.

Staff

Fall and Winter Qtrs.

65.219 Public Health and Community Resources

4 Q.H.

Principles of community health, with emphasis on emerging contemporary local, national, and world health problems; health services, including the choice of medical care; consumer health; and available community resources for enriching school health programs. Focus on public and community service through health education.

Staff

Spring Qtr.

65.222 Drug Use and Abuse

(Prereq. 65.114, majors only) 4 Q.H.

Investigation of the use and abuse of modern drugs in our society, covering prescription and nonprescription drugs, alcohol and tobacco, and their physiological and psychological effects on the body. The social problems surrounding drug abuse are discussed, as are various approaches to drug education in school programs.

Miss Maguire

Spring Qtr.

65.223 Human Sexuality and the Family

(Prereq. 50.131) 4 Q.H.

Physical, psychological, social, historical, semantic, and comparative cultural aspects of human sexuality; needs and problems at several stages of maturation, including various approaches to sex education in the school.

Staff

Fall Qtr.

65.225 Communicable and Degenerative Diseases

(Prereq. 18.120) 4 Q.H.

The disease immunity process, with emphasis on prevalent communicable diseases in the United States today and their transmission; chronic diseases; cardiovascular diseases; cancer, diabetes, and other constitutional and degenerative diseases and disorders which affect the nation's health.

Staff

Spring Qtr.

65.233 Organization and Administration of School and Community Health Education

4 Q.H.

Principles and methods of organization and administration of school health and community health education programs: ethics, personnel, budget, facility management, priorities.

Staff

Spring Qtr.

65.234 Health Problems of the School Child

4 Q.H.

Recognition of common physical, mental, and emotional health problems of children and youth, so that they may be dealt with intelligently by the classroom teacher.

Miss Maguire

Winter and Spring Qtrs.

65.235 Health Counseling

4 Q.H.

The identification of physical, mental, emotional, and social health problems; remedial procedures; and counseling techniques, so that problems may be dealt with intelligently by health educators.

Staff

Spring Qtr.

65.238, 65.239 Seminar

(Prereq. for 65.238 is 50.141) 2 Q.H.

(Prereq. for 65.239 is 65.238) 2 Q.H.

Discussion of current problems and new developments as they relate to health education in school and a variety of community settings. An introduction to research culminating in the writing of a research paper.

Staff

Spring Qtr.

65.240 Student Teaching/Field Experience

(Prereq. 65.217) 12 Q.H.

Observation and practical teaching experience in school health programs and/or field experience in selected community health education settings. Supervision and evaluation by personnel in cooperating schools and agencies and by Boston-Bouve' College faculty; seminars.

Staff

Fall Qtr.

Pharmacy

71.201 Pharmacy Orientation

1 Q.H.

A survey course designed to introduce the beginning Pharmacy student to the simple fundamentals of using the basic tools and equipment in the practice of pharmacy. Modern audiovisual aids explain the prescription balance, graduals, mortars and pestles, filtration, emulsification, tablet triturates, ointments and creams, suppositories, and prescription packaging.

Prof. Smith

Fall Qtr.

71.202 Pharmacy Orientation

1 Q.H.

Calculations to enable a student to prepare various pharmaceutical formulations and prescriptions. A programmed instruction text is used.

Prof. Smith

Winter Qtr.

71.228 Special Research Project

(Prereq. consent of Dean) 3 Q.H.

Research on special problems may be undertaken in one or more of the following areas: medicinal chemistry, pharmacognosy, pharmacology, pharmacy, and pharmacy administration.

Staff

Spring Qtr.

71.229, 71.230/Special Research Project

3 Q.H. ea.

A course of directed study or research in one of the pharmaceutical sciences wherein the student may undertake in-depth investigation of a special interest area.

Prof. Goldstein

71.243 Pharmaceutical Jurisprudence

4 Q.H.

A comprehensive analysis and interpretation of all laws relating to the practice of pharmacy. Federal and state food and drug laws, narcotic laws, Medicare and Medicaid regulations, and state pharmacy laws are discussed.

Prof. Goldstein

Fall Qtr.

71.245 Pharmacy Administration I

4 Q.H.

Socioeconomic aspects of pharmacy: the government's relationship to the pharmaceutical industry, trends in contemporary practice, third-party payment plans, macroeconomic impact on the industry, and the interaction of current concepts in pharmacy.

Prof. Goldstein

Winter Qtr.

71.251 Clinical Pharmacy

(Prereq. 65.218, 72.244) 3 Q.H.

Initial course in clinical pharmacy wherein the student learns to gather and evaluate medication data of patients, make interpretations of clinical laboratory data, and study potential drug interactions of clinical significance.

Staff

Winter Qtr.

71.253 Clinical Pharmacy

(Prereq. 71.251 or equiv.) 7 Q.H.*

Learning to observe patient response to medication and to evaluate and advise on all factors which may modify efficacy, safety, and economy of therapy. Lectures are devoted to basic facts needed to make evaluations and reports. Laboratory consists of two mornings of medical work rounds in the hospital, as well as case discussion orientation in various medical specialties.

Prof. Inashima

Spring Qtr.

71.261 Pharmacy I

(Prereq. 12.145, 11.172) 4 Q.H.*

The study of physicochemical theories and principles, and their application to pharmaceutical systems: intermolecular forces of the various states of matter, solubility phenomena, equilibria, complexation, micrometites, micro- and macromolecular systems, rheology, stability, and chemical kinetics.

Prof. Smith

Fall Qtr.

71.262 Pharmacy II

(Prereq. 71.261) 4 Q.H.*

Application of fundamental principles and methods to the formulation of official and nonofficial preparations and dosage forms.

Prof. Smith

Winter Qtr.

71.263 Pharmacy III

(Prereq. 71.262) 4 Q.H.*

A continuation of 71.262, with further reference to official and nonofficial preparations and more advanced dosage forms.

Fall and Winter Qtrs.

71.264 Pharmacy IV

(Prereq. 71.263) 4 Q.H.

Physicochemical considerations relating to drug effectiveness and dosage form design.

Spring Qtr.

71.265 Professional Practice I

(Prereq. 71.264) 5 Q.H.*

Correlates previous pharmacy courses. The compounding and dispensing of solid and liquid

*Including lab.

dosage forms of medication, with emphasis on chemical incompatibilities. Prescription practice involving specialties in the completely stocked, operative Gillette Pharmacy.

Prof. Palumbo

Fall Qtr.

71.266 Professional Practice II

(Prereq. 71.265) 4 Q.H.*

A continuation of Professional Practice I, including lecture demonstration designed to provide the student with practical knowledge of various surgical devices, appliances, and hospital and sickroom supplies used in modern patient care. Prescription practice is continued, with emphasis on specialties and possible drug interactions.

Prof. Palumbo

Winter Qtr.

71.267 Professional Practice III

(Prereq. 71.266) 4 Q.H.

The current practice of pharmacy. The practical aspects of pharmacy, including the various laws and problems of non-prescription pharmaceuticals applied to case situations in dispensing.

Spring Qtr.

71.270 Principles of Management

3 Q.H.

The fundamentals of business organization, with emphasis on the qualitative and legal aspects of management. An analysis of the marketing structure of the drug trade, forces of organizations, personnel management, and decision-making theory using non-qualitative data.

Prof. Goldstein

71.271 Financial Management

3 Q.H.

The quantitative aspects of management relating to the operation of hospital and retail pharmacies. Emphasis placed on basic accounting procedure, statement analysis, budgets, cash flow, and taxation.

Prof. Goldstein

71.272 Community Pharmacy Management

3 Q.H.

The management requirements for establishing a community pharmacy. A comparative analysis of the prevailing types of operations, location, leases and business organization, staffing, plant layout and design, and financial factors.

Prof. Goldstein

71.275 Seminar in Community Pharmacy Management

3 Q.H.

A discussion course on all phases of community pharmacy operations, with extensive utilization of the case method of instruction.

Prof. Goldstein

71.278 Hospital Pharmacy I

3 Q.H.

The relationship of the pharmacy to the total hospital structure. Design of the physical plant, staffing personnel management, and the law of institutional practice.

Prof. Goldstein

71.279 Hospital Pharmacy II

3 Q.H.

An analysis of various concepts in drug distribution, with extensive utilization of the case method of instruction.

Mr. Brass

71.280 Seminar in Hospital Pharmacy

3 Q.H.

A discussion course on special topics of current interest relating to hospital pharmacy practice.

Mr. Brass

71.282 Parenterals

3 Q.H.*

A study of parenterals, injectibles, and intravenous additives, with their formulations, properties, methods of preparation, and administration.

Prof. Krause

*Including lab.

72.230 Drug Analysis

(Prereq. 12.145) 5 Q.H.*

A survey of the quantitative analytical techniques applicable to the evaluation and assay of natural and synthetic drugs and their formulations. Emphasis on chromatographic, spectroscopic, and other instrumental methods, with selected laboratory experiments in the use of these as defined in official compendia.

Prof. Raffauf

Spring and Summer Qtrs.

72.241 Introduction to Therapeutics

(Prereq. 18.182, 12.145) 4 Q.H.

Principles of pharmacognosy, pharmacology, and medicinal chemistry applied to the discovery of drugs of therapeutic utility to man. A detailed discussion of drugs affecting the central nervous system.

Prof. Raffauf

Winter Qtr.

72.242 Chemical Pharmacology I

(Prereq. 72.241) 5 Q.H.

A continuation of 72.241. An interdisciplinary approach to the fundamental chemical and pharmacological principles of drug action. A discussion of the structure-activity relationship, adsorption characteristics, metabolic fate, pharmacodynamics, and therapeutic application principally of those drugs acting at sympathetic and neuroeffector junctional sites.

Prof. Neumeyer

Spring and Summer Qtrs.

72.243 Chemical Pharmacology II

(Prereq. 72.242) 6 Q.H.*

A continuation of 72.242, with special emphasis on drugs affecting the hematopoietic systems, the kidneys, and the adrenals.

Prof. Neumeyer

Fall Qtr.

72.244 Chemical Pharmacology III

(Prereq. 72.243) 6 Q.H.*

A continuation of 72.243, with special emphasis on anti-infectives and other chemotherapeutic agents, biologicals, and vitamins.

Prof. Raffauf

Winter Qtr.

72.250 Identification of Abuse Drugs

3 Q.H.*

An introduction to the chemistry, biological action, and methods of detection and assay of commonly abused drugs.

Prof. Raffauf

72.251 Radiopharmaceuticals

3 Q.H.*

The physics, chemistry, and pharmaceutical uses of radiopharmaceuticals. Methods for preparation and handling of these drugs are discussed in a practical way, as well as the rationale for their use in diagnosis and therapy.

Dr. Davis

73.203 Anatomy-Physiology

(Prereq. 12.145, 18.132) 5 Q.H.

Structure and function of cells, tissues, organs, and systems discussed in an integrated manner. The cell, the endocrine system, the reproductive system, and the nervous system are covered.

Prof. MacKeen

Fall Qtr.

73.204 Anatomy-Physiology

(Prereq. 73.203) 5 Q.H.*

Structure and function of the various life-supportive systems not covered in the first quarter. Laboratory is devoted to basic principles involved in understanding life systems and cell function.

Prof. Inashima

Winter Qtr.

73.223 Clinical Biochemistry

(Prereq. 90.151) 4 Q.H.*

Electrolytes, enzymes, and hormones of clinical and pathologic interest, with experiments to interpret disordered biochemistry.

Prof. Spector

Spring and Summer Qtrs.

73.245 Introduction to Pathology

(Prereq. 73.204, 73.223) 4 Q.H.

Basic concepts of pathology for the Pharmacy student, with emphasis on disease processes

*Including lab.

and alterations of normal biochemical mechanisms.

Fall Qtr.

73.247 Toxicology

(Prereq. 72.244) 4 Q.H.

Principles of toxicology, including FDA requirements relating to new drugs, environmental and other factors affecting the toxicity of therapeutic agents, mechanisms of toxicity, and clinical applications.

Prof. Reinhard

Spring Qtr.

Nursing

80.101 Fundamentals of Nursing

6 Q.H.*

Basic to all other courses in nursing. Focus is on the patient as an individual. Underlying this is the concept of homeostasis and the role of the nurse in meeting basic needs. Nursing action is based upon the principles drawn from the behavioral social and biological sciences. Assignments in patient care are designed to provide the student with opportunities to interpret these principles in the promotion of health and the prevention of illness.

Prof. Wilcox and Staff

Fall Qtr.

80.102 Fundamentals of Nursing

(Prereq. 80.101) 6 Q.H.*

The major focus is the identification of common deviations from homeostasis and the supportive nursing measures involved in the restoration of the patient to normal homeostasis.

Prof. Wilcox and Staff

Winter Qtr.

80.103 Fundamentals of Nursing

(Prereq. 80.102) 6 Q.H.*

The major focus is on the identification of specific long-term deviations from homeostasis and the nursing actions involved in the restoration of the patient to optimal function and adaptation.

Prof. Wilcox and Staff

Spring Qtr.

80.108 Introduction to Technical Nursing

5 Q.H.*

Focus on the role of the technical nurse as a member of the nursing team. Major emphasis placed upon the ability to provide direct nursing care through the use of the problem-solving process in developing and implementing an effective care plan, based upon principles from the biophysical, behavioral, and social sciences with broad application to nursing problems.

Prof. Kane and Staff

Fall Qtr.

80.109 Technical Nursing

(Prereq. 80.108) 2 Q.H.

Emphasis on the student's understanding of selected medical and surgical conditions and developing the ability to relate principles from biophysical and psychosocial sciences to concepts which give meaning to the nursing care of patients.

Prof. Kane and Staff

Winter Qtr.

80.110 Nursing Seminar

(Prereq. 80.108—80.109) 3 Q.H.

A scientific approach to the analysis of health problems and related medical and nursing therapy. Students present the results of independent research in class.

Prof. Kane and Staff

Spring Qtr.

80.111 Trends in Nursing

1 Q.H.

Acquaints the student with the evolution of nursing and its role in society today. Emphasis placed on the latter in discussions of preparation for nursing responsibilities inherent in the nursing role, and events that influence nursing practice as it is today and projected for the future.

Prof. Kane

Spring Qtr.

80.201 Nursing

3 Q.H.*

The first course in nursing introduces the student to varying levels of educational preparation in nursing, philosophy, purposes and objectives of the program; interpretation of one's own health behavior patterns; identification of basic needs of man; identification of patterns of

Including lab.

meeting one's own needs; distinguishing physiological, sociological, and psychological components of human sexuality; communication techniques; interpersonal processes; roles and role conflicts; group dynamics and group processes; and methods of problem solving.
Miss Gagnon and Staff Fall and Summer Qtrs.

80.202 Nursing

3 Q.H.*

The second course assists the student in identifying general social trends and their implications for nursing; characteristics of a profession; functions and purposes of nursing organizations; standards of behavior of the professional nurse; fundamental principles of malpractice law; legislation affecting health care and factors influencing the delivery of health care; major world health problems and selected health problems affecting the welfare of communities; and the roles and responsibilities of the comprehensive health team.

Miss Gagnon and Staff

Winter and Summer Qtrs.

80.203 Nursing

3 Q.H.*

The science of nutrition, assisting the student in recognizing factors influencing the formation of food habits in self and others; identifying normal nutrient needs according to age groups; recognizing the need for objectivity in working with individuals in meeting their needs, as well as the importance of nutrition and its relationship to health. Medical terminology commonly used is studied.

Miss Gagnon and Staff

Spring and Summer Qtrs

80.204 Nursing—Universal Needs

(Prereq. 80.201, 80.202, 80.203) 5 Q.H.*

Basic nursing theory and application in caring for people in hospital settings. Selected universal needs of man serve as the basis for the course, and the focus is on the nursing process as it relates to meeting these needs.

Prof. Gates and Staff

Fall and Winter Qtrs

80.205 Nursing—Common Problems I

(Prereq. 80.204) 5 Q.H.*

Exploring problems common to individuals who are unable to meet their own health needs. Clinical practice introduces skills and activities to meet the needs of patients with these common problems in general hospital settings.

Prof. Gates and Staff

Spring and Summer Qtrs

80.206 Nursing—Common Problems II

(Prereq. 80.205) 8 Q.H.

Physiological and psychological disturbances in illness. Emphasis on the analysis of patient problems and the nurse's role in the control of infection; pharmacology and drug therapy responses of body to stress, maintenance of nutrition, and patient teaching in long-term illness. Clinical laboratory experience and a weekly discussion-seminar group.

Prof. Goodfellow and Staff

Fall and Winter Qtrs

81.101 Medical-Surgical Nursing

(Prereq. 80.103) 11 Q.H.

Utilizing the concept that all illnesses produce alterations in body function, the student is introduced to selected conditions requiring medical and/or surgical intervention. Major emphasis in classroom and clinical instruction is upon the nurse's role in meeting patients' physical and psychosocial needs, further developing nursing techniques, and learning specific skills needed to care for assigned patients.

Prof. DeScenza and Staff

All Quarters

81.102 Medical-Surgical Nursing

(Prereq. 81.101) 7 Q.H.*

Sequential to 81.101. Designed to broaden the student's understanding of adults with more serious forms of physical illness. The content has been developed to present the nurse's responsibilities in caring for patients with alterations in physiologic functions and body image. Classroom and clinical experiences focus on principles and nursing skills that are involved in providing complex care for selected patients.

Prof. Carroll and Staff

All Quarters

81.201 Medical-Surgical Nursing

(Prereq. 80.206) 9 Q.H.*

Focuses on selected physiologic problems encountered in the care of adult patients. Guided clinical experiences are planned, with special emphasis on the effects of illness on the

individual's pattern of living, continuity of care, and health teaching. Classroom and clinical experiences focus on the knowledge and skills necessary to plan and implement comprehensive health care.

Prof. Johns and Staff

All Quarters

82.101 Maternal and Child Health

(Prereq. 19.141, 19.142, 80.103) 12 Q.H.*

Focuses on the family and the individual and their developmental task, with emphasis on positive health practices within the family unit. The nursing approach centers upon the health needs of mothers and children of all ages. The needs of the hospitalized child are identified by studying the effect of illness upon his normal growth and development. The common illnesses of childhood are discussed.

Prof. Otto and Staff

All Quarters

82.201 Maternal and Child Health

(Prereq. 80.206, 19.141) 9 Q.H.*

Maternal and child nursing focuses on the nursing needs of mothers and children. This course considers various aspects and stresses encountered within the family structure, particularly as they relate to the expanding family and the child's need in health or illness. Exploration is made of the present-day problems relating to maternal and child welfare and their implications for society.

Prof. Lynch and Staff

All Quarters

83.101 Psychiatric Nursing

(Prereq. 81.101, 82.101) 6 Q.H.) 6 Q.H.*

Assists the student to acquire additional knowledge of human behavior; to provide the opportunity to achieve understanding of selected human motivations and defenses; and to learn additional interpersonal skills which may be used in the nursing care of patients. The opportunity to apply this knowledge, to observe and analyze behavior, and to practice skills is offered in supervised laboratory sessions.

Prof. Gonyow and Staff

Fall, Winter, and Spring Qtrs.

83.201 Psychiatric-Mental Health Nursing

(Prereq. 80.206) 9 Q.H.*

Designed to increase and develop knowledge of mental illness, understanding of the dynamics of human behavior, and the interrelationship of theory and practice as it applies to clinical and community aspects of mental health and psychiatric nursing.

Prof. Lee and Staff

All Quarters

84.201 Public Health Nursing

(Prereq. 81.201, 82.201, 83.201) 9 Q.H.*

Increases understanding of the variety of ways in which communities organize to meet the health and welfare needs of their members. Principles of public health and public health nursing are examined in depth. Attention is given to current health and welfare legislation, environmental factors affecting health, and the role of the nurse in prevention of disease and maintenance of health. Laboratory experiences provide opportunities to work with individuals, families, and community agencies.

Prof. Tingle and Staff

Fall and Winter Qtrs.

85.201 Contemporary Nursing

(Prereq. 84.201) 9 Q.H.*

The final nursing course before graduation. Includes lectures, seminars, progress reports, and eight weeks of student-selected placement experience. The core content includes legal aspects, roles, leadership, change, and research methods. Students demonstrate self-direction by defining their objectives for placement experience, pursuing an area of nursing in which they are particularly interested, utilizing basic principles of research, and evaluating their own performance.

Staff

Spring Qtr.

Allied Health Professions

General Courses

36.102 Hospital Law

2 Q.H.

An analysis of the legal principles relating to medical and paramedical practice within a

Including lab.

hospital environment. The common law and statutory rights of the hospital, practitioner, and patient are discussed.

Spring Qtr. 1974

86.107 Medical Terminology

4 Q.H.

A study of the language of medicine, including prefixes, suffixes, roots, abbreviations, disease and operative and drug terms. Also included are terms related to all area specialties. The terms are studied as they relate to a specific system of the body.

Prof. Zamczyk

Fall Qtr. 1974

86.112 Foundations of Medical Science I

3 Q.H.

Major disease problems in our society and modes of treatment. Discussion of organized care, diagnosis, and treatment. Consideration of reproduction, birth, and pediatrics.

Fall and Winter Qtrs. 1973-74

86.113 Foundations of Medical Science II

(Prereq. 86.112) 3 Q.H.

A continuation of 86.112 covering heart, cancer, stroke, blood and lymphatic diseases, accidents, and musculoskeletal, respiratory, and gastrointestinal diseases.

Spring and Summer Qtrs. 1974

86.174 Health, Disease, and Disability I

3 Q.H.

Major disease or disability states and their impact on human physiology and psychology. Social and individual response to these states. Lectures, demonstrations, field visits. Part I emphasizes medical areas.

Winter Qtr. 1974

86.175 Health, Disease, and Disability II

(Prereq. 86.174) 3 Q.H.

A continuation of 86.174. Part II emphasizes surgical areas.

Spring Qtr. 1974

87.131 Dynamics of Health Care I

1 Q.H.

Orientation of the Allied Health Profession student to the history and organization of health care in the United States, with an introduction to the roles of the health-care team members.

Allied Health Faculty

Fall Qtr. 1973

87.132 Dynamics of Health Care II

1 Q.H.

Orientation of the Allied Health Profession student to interdisciplinary health care organization, administration, and procedures.

Allied Health Faculty

Winter Qtr. 1974

87.133 Dynamics of Health Care III

1 Q.H.

Orientation of the Allied Health Profession student to current social situations and problems in the delivery of medical care services.

Allied Health Faculty

Spring Qtr. 1974

MEDICAL LABORATORY SCIENCE

The Medical Laboratory Science professional courses are taught by University faculty, together with supportive clinical faculty.

87.100 Laboratory Medicine—Orientation

1 Q.H.

The history and development of the medical laboratory technologies and pathology.

Prof. Karlsson

Winter Qtr. 1974

87.101 Basic Medical Laboratory Science

(Prereq. 18.132, 12.104, or 12.107) 4 Q.H.*

Introductory course in the basic medical laboratory sciences: methods, principles, theories.

Medical Laboratory Science Faculty

Fall Qtr. 1973

Spring Qtr. 1974

87.102 Basic Medical Laboratory Hematology

(Prereq. 87.101 or concurrent) 2 Q.H.*

Principles and procedures of basic medical laboratory hematology, including basic coagulation.

Prof. Karlsson

Winter and Summer Qtrs. 1974

- 87.103 Basic Medical Laboratory Immunohematology** (Prereq. 87.101) 2 Q.H.*
 Basic principles in immuno-hematology and related techniques, with particular emphasis on those procedures used in blood banking.
 Prof. Barr Winter and Summer Qtrs. 1974
- 87.105 Basic Medical Laboratory Chemistry and Instrumentation** (Prereq. 87.101, 12.171) 4 Q.H.*
 Principles, procedures, and techniques of basic clinical chemistry and instrumentation.
 Prof. Hallsworth Spring and Summer Qtrs. 1974
- 87.111 Medical Microbiology Applied Study (At Hospital)** (Prereq. 18.220, 87.101) 4 Q.H.
 Clinical practicum in applied microbiology at an affiliated accredited hospital school of medical technology.
 Spring Qtr.
- 87.112 Hematology and Immunohematology Applied Study (At Hospital)** (Prereq. 87.102, 87.103) 4 Q.H.*
 Clinical practicum in applied hematology, coagulation, and and blood banking at an affiliated accredited hospital school of medical technology.
 Fall Qtr.
- 87.115 Medical Laboratory Chemistry Applied Study (At Hospital)** (Prereq. 12.145, 12.171, 87.105) 4 Q.H.*
 Clinical practice in applied clinical chemistry at an affiliated accredited hospital school of medical technology.
 Winter Qtr.
- 87.120 Communications in the Health Sciences** 3 Q.H.
 Effective communication in the medical scientific community.
 Staff Spring Qtr. 1974
- 87.121 Quality Control** (Prereq. 12.171, 10.105, 87.101, 87.105) 2 Q.H.
 Basic statistical methods used in medical laboratory quality control.
 Prof. Hallsworth and Dr. Copeland Spring and Summer Qtrs. 1974
- 87.190 Undergraduate Research** (Prereq. 87.102, 87.103, 87.105) 2 Q.H.
 Special problems in laboratory medicine involving individual research under the direction of a faculty member.
 Prof. Karlsson Fall Qtr. 1973
- 87.201 Pathogenic Microbiology** (Prereq. 18.220 and 87.101) 4 Q.H.*
 Methods of identification and differentiation of normal and pathogenic body flora. Basics of virology; fundamentals of mycology and mycological infections.
 Profs. Barr and Bump Spring Qtr.
- 87.202 Hematology and Immunohematology** (Prereq. 18.132, 87.102, 87.103) 4 Q.H.*
 Review of hemopoiesis morphology and physiology of blood cells and bone marrow. Basic lectures with complementary clinical pathology conferences; discussions on current literature and applied laboratory experiences.
 Prof. Karlsson Fall Qtr. 1973
- 87.203 Medical Immunology and Serology** (Prereq. 87.201, 87.103) 2 Q.H.*
 Medically applied immunological and serological concepts and procedures.
 Prof. Bump and Dr. Gozzo Fall Qtr. 1973
- 87.204 Medical Parasitology** (Prereq. 18.220) 2 Q.H.*
 Laboratory identification of human parasites and a study of their life cycles.
 Prof. Bump Winter Qtr. 1974
- Including lab.

- 87.205 Clinical Chemistry** (Prereq. 12.171, 12.145, 87.101, 87.105) 4 Q.H.*
Principles and methodologies of current clinical chemistry procedures used in the medical laboratory for the assessment of human physiological conditions.
Prof. Hallsworth Winter Qtr. 1974
- 87.221 Medical Laboratory Management** 2 Q.H.
Principles of laboratory supervision, communication, and personnel relations. Professional ethics, relationships, and legal responsibilities.
Prof. Bump Spring Qtr.
- 87.226 Medical Laboratory Science Education** 2 Q.H.
Use, evaluation, and development of educational media with particular emphasis on correlation of didactic and clinical instruction.
Profs. Barr and Donahue Winter Qtr. 1974

MEDICAL RECORDS ADMINISTRATION

- 86.151 Medical Record Science I** (Prereq. two years of liberal arts) 4 Q.H.*
Introduction to medical records; history of the medical record and medical record forms. A study of the professional medical record administrator and his relationship to the health facility. Medical staff and committees in hospital. Quantitative analysis of medical records.
Prof. Zamczyk Spring and Summer Qtrs. 1975
- 86.152 Medical Record Science II** (Prereq. 86.151) 4 Q.H.*
The numbering, filing, securing, and preserving of medical records. Principles of law as related to patient care and medical records. Study and practice of medical transcription. The rules of privileged communications and the release of information to agencies are stressed.
Fall and Winter Qtrs. 1975-76
- 86.153 Medical Record Science III** (Prereq. 86.152) 4 Q.H.*
Basic principles of compiling statistics for hospital and other health institutions. Includes the preparation of the daily census, discharge analysis, monthly, annual, and special reports. Birth and death certificates are included. Principles of Standardized Nomenclature of Diseases and Operations and International Classification of Disease, adapted - 8. Study of other indexes used in medical records departments.
Spring and Summer Qtrs. 1976
- 86.154 Advanced Medical Record Science IV** (Prereq. 86.153) 4 Q.H.*
Advanced aspects of medical record science. Includes developing of forms and forms control, planning and managing, new record systems; advanced aspects dealing with statistics and consulting in extended-care facilities and nursing homes.
Fall and Winter Qtrs. 1976-77
- 86.155 Organization and Management of Medical Record Department I** 3 Q.H.
The hospital: patterns of organization, lines of responsibility and authority, medical staff and administrative organization, departmental functions and organization. Fundamental principles and successful practices in accomplishing office work. Office management problems and their solution; conceptual framework for the operation of essential management function, facilities, solutions, and contributions of the office.
Fall and Winter Qtrs. 1976-77
- 86.156 Organization and Management of Medical Record Department** (Prereq. 86.155) 3 Q.H.
Development of an efficient medical record department in any medical care facility. Application of the principles of organization and management in the development and administration of a system of handling medical information.
Spring and Summer Qtrs. 1977
- 86.157 Seminar in Medical Records** (Prereq. 86.154 or concurrently) 2 Q.H.
Case study and discussion for the purpose of integrating the discrete skills and knowledge of

*Including lab.

the professional curriculum into a meaningful whole by student analysis of real and hypothetical problems.

Fall and Winter Qtrs. 1976-77

86.252 Applied Medical Record Science—Directed Study I (Prereq.86.151, 86.107) 3 Q.H.*
Clinical practicum in medical record science and management techniques at one or more of several affiliated hospitals.

Prof. Zamczyk

Fall and Winter Qtrs. 1973-74

86.253 Applied Medical Record Science—Directed Study II (Prereq.86.252) 3 Q.H.*
Clinical practicum in medical record science and management techniques at one or more of several affiliated hospitals.

Spring and Summer Qtrs. 1974

86.254 Applied Medical Record Science—Directed Study III (Prereq. 86.253) 2 Q.H.*
Clinical practicum in medical record science and management techniques at one or more of several affiliated hospitals.

Fall and Winter Qtrs. 1974-75

RESPIRATORY THERAPY

86.181 Introduction to Respiratory Therapy 2 Q.H.

The development and understanding of the respiratory therapist's role as a member of the health care profession. A concise survey of the normal structures and functions of the human body with particular emphasis on the organs of respiration and circulation and the principle of oxygen and tissue metabolism.

Mr. McNeil and Mr. Donahue

Fall Qtr. 1973

86.182 Introduction to Respiratory Therapy II (Prereq. 86.181) 3 Q.H.*
An expansion of the information from 86.181 into the area of cardiopulmonary pathology, with an introduction to the therapy modalities.

Mr. McNeil and Mr. Donahue

Winter Qtr. 1974

86.183 Mechanics in Respiratory Therapy (Prereq. 86.182) 4 Q.H.*
The application of basic microbiologic principles to the sterilization of respiratory therapy equipment. Theory and classification of flowmeters, regulators, nebulizers, humidifiers, and ventilators. The laboratory is devoted to the application and troubleshooting of the apparatus.

Mr. McNeil and Mr. Donahue

Spring Qtr. 1974

86.184 Procedures of Respiratory Therapy I (Prereq. 86.183) 4 Q.H.*
This course is designed as the didactic portion of beginning clinical experience to augment the student's understanding of physiologic respiratory care. Physical examination of the chest, laboratory diagnosis, and chest X-ray are presented. The pathophysiologic basis of the therapy of restrictive and obstructive diseases, acute respiratory failure, and chronic respiratory failure are discussed in detail.

Prof. Cassara

Fall and Winter Qtrs. 1973-74

86.185 Procedures of Respiratory Therapy II (Prereq. 86.184,86.284) 4 Q.H.*
The major chest diseases of neonates, children, and adults from the approach of diagnosis, etiology, treatment, and prognosis.

Prof. Cassara

Spring and Summer Qtrs. 1974

86.186 Respiratory Diagnostics (Prereq. 86.185, 86.285) 4 Q.H.*
The third didactic companion to the third clinical experience quarter. It teaches the theory and technique of blood gas analysis and pulmonary function testing.

Staff

Fall and Winter Qtrs. 1974-75

86.187 Advanced Respiratory Care (Prereq. 86.186, 86.286) 4 Q.H.*
Principles of departmental organization and concepts of organizational professional responsibilities. Each student presents an independently researched clinical paper based on

*Including lab.

the current literature and visits to representative patients in the clinical affiliates.

Prof. Cassara

Spring Qtr. 1975

86.197 Procedures in Respiratory Therapy IV (for 1973-1974 only) (Prereq. 86.196) 4 Q.H.
Applied cardio-pulmonary physiology.

Mr. McNeil and Mr. Donahue

Winter Qtr. 1974

86.198 Procedures in Respiratory Therapy V (for 1973-1974 only) (Prereq. 86.197) 4 Q.H.
Principles and practices involved in the supervision and administration of a respiratory therapy department. Intensive review for professional qualification in oral and written examination.

Prof. Cassara

Spring Qtr. 1974

86.284 Directed Applied Study—Respiratory Therapy (Prereq. 86.184 concurrent) 4 Q.H.*
Clinical experience matched to concurrently taught didactic subject matter. Skills acquired include: physical examination of the chest, airway management techniques, basic oxygen administration, and intermittent positive pressure breathing exercises.

Clinical Faculty

Fall and Winter Qtrs. 1973-74

86.285 Directed Applied Study—Respiratory Therapy (Prereq. 86.185 concurrent) 4 Q.H.*
Clinical material matched to concurrently taught didactic subject matter. Skills acquired include: tracheostomy and endotracheal tube care, management of continuous artificial ventilation with volume and pressure pre-set devices, and chest physical therapy techniques.

Clinical Faculty

Spring and Summer Qtrs. 1974

86.286 Directed Applied Study—Respiratory Therapy (Prereq. 86.186 concurrent) 4 Q.H.*
Clinical experience matched to concurrently taught didactic subject matter. Skills acquired include: spirometric measurement of lung volumes and flow rates, dilution techniques for measurement of residual volume, measurement of A/a gradient and vd/vt , and blood gas measurement of PO_2 , PCO_2 , and pH.

Clinical Faculty

Fall and Winter Qtrs. 1975

Cooperative Education

90.251 Placement Techniques

1 Q.H.

Career selection and development are discussed concurrently with resume preparation, interviewing technique, and effective written communication to facilitate the planning and implementation of a professional career program.

Fall and Winter Qtrs.

90.253 Professional Development for Teachers

1 Q.H.

Teacher certification, professional ethics, and professional development are examined, along with effective methods of achieving career goals through resume preparation, written communication, and the interviewing process.

Fall and Winter Qtrs.

90.254 Professional Development for Nurses

1 Q.H.

Personal, legal, and professional responsibilities of nursing are discussed concurrently with resume preparation, personal presentation, and effective written communication.

Fall and Winter Qtrs.

90.255 Professional Development in Criminal Justice

1 Q.H.

Career options in criminal justice are reviewed, along with the techniques of resume preparation, interviewing, and effective written communication.

Fall and Winter Qtrs.

90.257 Professional Development for Engineers

1 Q.H.

Career development in the respective engineering fields is examined with a view to current practice and developing trends, along with discussion of resume preparation, interviewing

*Including lab.

techniques, and effective written communication.

Fall and Winter Qtrs.

Military Science

Military Science I

91.101 U.S. Defense Establishment

1 Q.H.

Emphasis is given to the history, organization, and mission of the Department of Defense. Further, the mission and organization of the U.S. Army is studied, with emphasis given to the integration of small units into larger units and the general design of military organization.

Fall Qtr.

91.102 Map and Aerial Photo Reading

(Prereq. 91.101) 1 Q.H.

Use of maps and aerial photographs to develop an understanding and an appreciation of these instruments of command and their application to the military service.

Winter Qtr.

91.103 Leadership Laboratory

(Prereq. 91.102) 1 Q.H.

Progressive training in leadership, drill, and command. Exercise in command is stressed wherein students perform duties and functions as officers incident to conduct of training.

Spring Qtr.

Military Science II

91.104 American Military History and Tactics

(Prereq. 91.103) 2 Q.H.

Selected battles and campaigns, coupled with major periods of international crises, are studied with a view towards giving the student an appreciation of the development of the U.S. Army. An introduction to the fundamentals and principles of small unit tactics.

Fall and Winter Qtrs.

91.105 Officer Development Leadership Laboratory

(Prereq. 91.104) 1.5 Q.H.

The functions, duties, and responsibilities of junior military leaders and the development of leadership potential through practical exercises; discussion of the ROTC Advanced Course. Leadership laboratory as described in 91.103.

Spring and Summer Qtrs.

Military Science III

91.106 Leadership and Management

(Prereq. 91.105) 2 Q.H.

Review of the basic problems in leading small units, with emphasis on the role of a platoon leader in setting goals, standards, and motivating performance. Familiarization with communications equipment organic to small units within the Army. Methods of instruction for small unit training classes.

Fall and Winter Qtrs.

91.107 Fundamentals and Dynamics of the Military Team I—Leadership Laboratory

(Prereq. 91.106) 2 Q.H.

Organization of small units within the army and the support which they receive. Familiarization with the principles and fundamentals of small unit tactics. Leadership laboratory as described in 91.103.

Spring and Summer Qtrs.

91.108 Fundamentals and Dynamics of Military Team II

(Prereq. 91.107) 2 Q.H.

Staff organization and responsibilities; troop leading procedures; decision making; composition and development of military intelligence; combined arms operations from patrol to company level. A discussion of the role of the branches of the army within the overall mission of the army.

Fall and Winter Qtrs.

Military Science IV

91.109 Leadership and Management Leadership Laboratory

(Prereq. 91.108) 2 Q.H.

Composition and mission of combined arms forces, company size through battalion size, in

offensive, defensive, and special operations. Leadership laboratory as described in 91.103
Spring and Summer Qtrs

91.110 Leadership and Management II—Internal Defense Development

(Prereq. 91.109) 2 Q.H.

The organizational, environmental, personnel, and operational problems encountered by the manager of the modern military team. Included is a discussion of the strategic environmental background in which the military team is employed.

Fall and Winter Qtrs

91.111 Pre-Camp Orientation—Leadership Laboratory

(Prereq. 91.110) 2 Q.H.

An orientation designed to prepare the cadet for summer camp. Physical training is emphasized to ensure that the cadet is physically prepared. Leadership requirements for the future officer are discussed.

Spring Qtr.

Criminal Justice

92.104 Administration of Criminal Justice

4 Q.H.

Surveys the entire contemporary criminal justice system from the initial contact with the offender through prosecution, disposition, incarceration, and release to the community. Emphasis is placed on major systems of social control: police, corrections, juvenile justice, mental health systems, and their policies and practices relative to the offender. A balance is maintained in providing legal, empirical, and sociological materials.

Prof. Senna

Fall and Winter Qtrs

92.110 Police-Community Relations

4 Q.H.

Police-public contact; uses of the communications media in projecting the police image; responsibilities of police in dealing effectively with minority groups, civil rights, civil disorder, and public protection. An exploration of the role and function of the role in intergroup relations.

Prof. Sheehan

Spring and Summer Qtrs

92.112 Criminal Behavior

4 Q.H.

An analysis of various nonconformist and criminal activities generating contemporary subcultures. Societal norms and legal precepts, including the police, the courts, and the correctional systems, are explored as they relate to deviant subcultures.

Prof. Natoli

Fall and Winter Qtrs.

92.113 Law Enforcement Procedures and Social Structure

4 Q.H.

Law enforcement systems in relation to class structure, political, economic, and social power; police and community subcultural developments and problems of professionalization.

Prof. Natoli

Spring and Summer Qtrs.

92.115 Police Operations

4 Q.H.

A general survey of police operational procedures, including patrol, traffic, interrogations, and report writing. Roleplaying is used extensively to demonstrate interviewing methods.

Prof. Sheehan

Spring and Summer Qtrs.

92.131 Law Enforcement Administration and Management

4 Q.H.

The principles of police organization, administration, and management, including staff and line functions, chain of command, span of control, selection of personnel, and promotional systems. Consideration is also given to special problems such as strikes, natural and atomic disasters, narcotic traffic, and vice control.

Prof. Sheehan

Fall and Winter Qtrs.

92.132 Police Supervision

The police supervisor's role in discipline, intradepartmental relations, problem-handling and personnel policies. Problems relating to supervisory relationships, wages, grievances, morale, and safety.

Prof. Natoli

Spring and Summer Qtrs.

92.134 Const. Problems I: The Police and the Criminal Suspect 4 Q.H.
Utilizing Supreme Court decisions and other sources, this course encompasses a study of the constitutional rights of speech, press, religion, association, equal protection of the laws, and their relevance to a democratic society.
Prof. Kassler Spring and Summer Qtrs.

92.137 Criminology 4 Q.H.
Patterns and evolution of criminal behavior, the social forces involved, and development of the individual criminal; administration of criminal justice; law, courts, police, prisons.
Prof. Schafer Fall and Winter Qtrs.

92.138 Juvenile Delinquency and Youth Crime (Prereq. 92.137 or equiv.) 4 Q.H.
The sociological and psychological approaches and their implications for a typology of delinquency; problems of prevention, treatment, and rehabilitation.
Prof. Schafer Spring and Summer Qtrs.

92.140 The Nature and Behavior of Fire (Prereq. 11.113, 114 or 18.114, 115 or 92.113 or equiv.) 4 Q.H.
A course in the examination and behavior of fire. Deals with fire-related phenomena such as convection, radiation, contact, and ignition. This embodies consideration of arson, explosions, asphyxiation, and combustibility. The engineering is dealt with in terms of fireproofing agents such as plastics, textiles, building materials, and the chemistry of the halogens. Finally, some time is given to areas of fire experimentation and the potential for more sophisticated inquiry.
Prof. Cunliffe Fall and Winter Qtrs.

92.141 Criminal Law: Procedural Due Process 4 Q.H.
Utilizing current Supreme Court decisions and other sources, this course examines the relationship between the Bill of Rights and the states, with primary emphasis on the guarantees of fair trial, counsel, privacy, immunity from self-incrimination, and other constitutional safeguards in state and Federal criminal proceedings.
Prof. Kassler Fall and Winter Qtrs.

92.142 Const. Problems II: The Courts and the Accused 4 Q.H.
Rules of evidence, principles of exclusion, evaluation and examination of evidence and proof, competency, consideration of witnesses. Fundamentals of courtroom procedure, testifying in court, the principles of prosecuting a case, the introduction of evidence. Roleplaying is used as a learning device in mock trials. Class members are required to attend and report on criminal trials.
Prof. Kassler Spring and Summer Qtrs.

92.143 Introduction to Criminalistics 4 Q.H.*
A survey of the elements of microscopy, spectroscopy, and basic chemistry as they apply to the study of firearms, hair, fibers, blood, paint, tools, glass, documents, laundry marks, poisons, and other materials which comprise physical evidence.
Prof. Cunliffe Fall, Winter, and Spring Qtrs.

92.146 Legal Aspects of Society 4 Q.H.
Twentieth-century society, with an emphasis upon the legal structure and its impact upon society.
Prof. Kassler Fall and Winter Qtrs.

92.147 The Juvenile and the Courts 4 Q.H.
Course work examines the juvenile court: its philosophy, procedure, and personnel. Focus is on the discretionary processes by which juveniles are labelled delinquent, dependent and neglected. The roles played by police, prosecution, defense, bench, and social service workers are considered. Field visits arranged.
Prof. Pieczenik Fall and Winter Qtrs.

*Including lab.

92.155 Seminar in Law Enforcement

4 Q.H.

An opportunity for free discussion about the numerous problems facing the law enforcement officer. Periodic oral and written reports are required. Guest lecturers are invited to participate in and lead discussion sessions. An effort is made to have each student formulate his own philosophy of law enforcement prior to his graduation.

Prof. Sheehan

Spring and Summer Qtrs.

92.156 Seminar in Law and Criminal Justice

4 Q.H.

Prof. Kassler

Fall Winter, and Spring Qtrs.

92.157 Research Methods in Criminal Justice

4 Q.H.

Development of research design of the kind most useful to criminal justice problems; understanding of some of the most important issues and problems facing researchers in the field; use of various data collection methods including observation, interviewing, questionnaire construction, and scales for survey analysis; validity and reliability; computer application in criminal justice.

Prof. Siegel

Fall and Winter Qtrs.

92.160 Social Welfare Problems in Criminal Justice

4 Q.H.

A critical examination of culture-of-poverty themes; a brief study of the social welfare system; development of techniques for referral to social agencies; development of self-awareness through thoughtful evaluation of personal bias and experience.

Prof. Ames

Fall, Winter, and Spring Qtrs.

92.161 Delinquency and Adolescent Behavior

4 Q.H.

Psychodynamic development of the adolescent personality and growth of delinquency patterns in this culture. Current novels and essays, as well as standard texts are used.

Prof. Ames

Fall, Winter, and Spring Qtrs.

92.162 Introductory Statistics and Social Research

4 Q.H.

An elementary survey and analysis of the uses of statistics and social research methods, with special reference to utilization of data from the field of criminal justice. The first part of the course covers descriptive statistics and the second examines the basic techniques in social research. Attention is given to methods of collecting, analyzing, and interpreting statistical data, and to the use of statistics in the development of research designs.

Prof. Senna

Fall and Winter Qtrs.

92.165 Rehabilitation of the Offender

4 Q.H.

Basic concepts for influencing and changing human behavior. Special attention is given to an examination of various types of current programs and services developed in the criminal justice system to rehabilitate the offender. Particular emphasis is made of contemporary practices in corrections, such as the community-based work release program, halfway houses, and various forms of individual treatment services.

Prof. Senna

Spring and Summer Qtrs.

92.191, 92.192, 92.193, 92.194 Directed Study

4 Q.H. (each)

92.207 Suicide

(Prereq. consent of instructor) 4 Q.H.

The social and psychological implications of suicide. Theoretical readings begin with Durkheim and go through Alvarez. One day each week spent in study and research at "hot lines" and suicide prevention centers in the metropolitan area.

Prof. Ames

Spring and Summer Qtrs.

92.209 Female Offender

4 Q.H.

The course addresses itself to the female at the various stages in the criminal justice system, from commission of a crime to parole. Both the juvenile and adult offender is studied. The thrust of the course is a critical analysis of existing theory and research on the female offender, with emphasis on the socialization, roles, and social participation of women in society at-large. The male offender is also considered at each level in a comparative sense.

Prof. Turek

Fall and Winter Qtrs.

92.210 Topics in History of Criminal Justice

4 Q.H.

An historic survey of the principles of criminal justice in the ancient and medieval periods, with emphasis upon the impact of religion and philosophy.

Dean Rosenblatt

Fall Qtr.

92.211 Topics in History of Criminal Justice

4 Q.H.

A continuation of the historic survey with an examination of the effect of the Renaissance Reformation and the rise of nation states.

Dean Rosenblatt

Winter Qtr.

92.280 Seminar in Victimology

(Prereq. Juniors and Seniors with consent of instructor) 4 Q.H.

Criminal-victim relationships, with emphasis on victim-precipitated crimes and compensation to the victims. The concept and significance of "victimology"; time, space, sex, age, and occupational factors in criminal-victim relationships; victims of murder, rape, other violent crimes, and property crimes; victim typology; the public or victim; restitution to crime victims. The functional responsibility of the victim.

Prof. Schafer

All Quarters

92.285 Practicum in Community Service

(Prereq. 92.161 or equiv. and consent of instructor) 4 Q.H.

Prof. Ames

All Quarters

Interdisciplinary Courses

93.110 Programming Computers with FORTRAN (Prereq. one year college math.) 4 Q.H.

Techniques for programming problems on any large computer. Emphasis is on general programming methods using the language of FORTRAN. A large number of example problems are presented in an effort to display the applicability of computers to a wide variety of professional activities. No prior computer experience is required.

Prof. Rule

Fall, Winter, and Spring Qtrs.

93.111 Advanced FORTRAN Programming

(Prereq. 93.110) 4 Q.H.

Higher-level aspects of the FORTRAN language are considered. Topics covered include: the use of software packages, the manipulation of large data arrays, processing of non-numeric information, magnetic tape operations, and data file management. An introduction to systems analysis is presented, with emphasis on Monte Carlo and queuing simulation techniques.

Prof. Finkenaur

Fall, Winter, and Spring Qtrs.

93.113 Computers for the Social Sciences

4 Q.H.

Simple FORTRAN is covered only to the point where students can solve elementary original problems. Emphasis is then given to communicating with a discipline-oriented software package, SPSS (Subroutine Package for Social Scientists), to show how computers solve problems peculiar to the social scientist.

Prof. Rule and Staff

Winter Qtr.

93.120 An Analysis of American Racism

4 Q.H.

A seminar in contemporary aspects of racism in America. The cycle by which racism in our institutions helps form our attitudes, and how our attitudes in turn shape our institutions, is studied and discussed. Emphasis is on the practical, day-to-day aspects of racism, rather than the theoretical and historical.

93.125 COBOL Programming I

4 Q.H.

Fundamentals of computer programming in COBOL. Topics include: elementary computer functioning, program organization, input/output operations, arithmetic and data-handling verbs, and program logic development through the use of flow charts. Storage and manipulation of large data files on magnetic tape are introduced. No prior computer experience is required.

Prof. Finkenaur

Fall, Winter and Qtrs.

93.126 COBOL Programming II

(Prereq. 93.125) 4 Q.H.

Higher-level aspects of the COBOL language are considered. Use of decision tables in development of program logic. Improving program efficiency. Error detection and minimization techniques. Bulk data storage in magnetic tape and disc files. Storing, merging, updating, sorting, and purging of data files. Report generation.

Prof. Finkenaur

Spring Qtr.

93.151 General Biochemistry

(Prereq. two quarters organic chemistry) 4 Q.H.

Introduction to biochemical compound types, occurrence, chemistry, and introduction to metabolism

93.152 Physical Biochemistry

(Prereq. 93.151) 4 Q.H.

Bioenergetics, enzymes, and enzyme kinetics, with application to central area of metabolism biooxidation and reduction processes.

Chemistry Staff

Spring and Summer Qtrs.

93.153 Metabolic Biochemistry

(Prereq. 93.152) 4 Q.H.

Survey of intermediary metabolism, including carbohydrate, lipid, protein, and nucleic acid biochemistry.

Prof. Bialy (Biology)

93.160 American Musical Theatre

4 Q.H.

An interdisciplinary course, taught by the departments of Drama and Music. The development of the American musical, from the *Black Crook* to *Hair* and *Jesus Christ Superstar*, as an entertainment and as a serious art-form, through an examination of script, score, dance, and design. Works by Bernstein, Rodgers and Hammerstein, the Gershwins, Weill, Lerner and Loewe, and Cole Porter, are examined. Guest lecturers, recordings, films, live productions, supplement the course.

Prof. Blackman and Silverman

Fall and Winter Qtrs.

93.201 Computers in Our World

2 Q.H.

An introductory course designed for Liberal Arts majors, showing how computers function and how they are used. No prior experience is needed. Students learn how to use the large University computer.

Dr. Eiseman

Fall and Winter Qtrs.

93.202 Using Computers

2 Q.H.

An intermediary level course designed for Liberal Arts majors, exploring the use of computers to solve typical problems.

Dr. Eiseman

Winter and Spring Qtrs.

93.203 Advanced Computer Applications

2 Q.H.

An advanced level course designed for Liberal Arts majors with programming experience. Application of sophisticated techniques to solve more advanced and difficult problems.

Dr. Eiseman

Spring Qtr.

93.210 Assembly Language Programming

(Prereq. knowledge of some compiler language) 4 Q.H.

The unique programming concepts encountered in assembly language programming. Course content includes: number system theory, internal machine representation of information, complement arithmetic, basic machine language programming, assembly language instructions; concepts of addressing, subroutine linkage, character manipulation; floating vs. fixed point operations.

Prof. Rule and Staff

Spring Qtr.



Introducing Northeastern University



**Freshman Programs
1973-74**

Equal Opportunity Policy

Northeastern University is committed to a policy of providing equal opportunity for all. In all matters involving admission, registration, and all official relationships with students, including evaluation of academic performance, the University insists on a policy of nondiscrimination. Northeastern University is also an equal opportunity employer; it is institutional policy that there shall not be any discrimination against any employee or applicant for admission because of race, color, religion, sex, age, or national origin.



The New England Association of Colleges and Secondary Schools accredits schools and colleges in the six New England states. Membership in one of the six regional accrediting associations in the United States indicates that the school or college has been carefully evaluated and found to meet standards agreed upon by qualified educators. Colleges support the efforts of public school and community officials to have their secondary schools meet the standards of membership.

Introducing Northeastern University

Enjoy learning on the world-famous Cooperative Plan

Boston-Bouvé College
College of Business Administration
College of Criminal Justice
College of Education
College of Engineering
College of Liberal Arts
Lincoln College
College of Nursing
College of Pharmacy and Allied Health Professions

Freshman Programs





A Message from the President

When a college or university is located in an urban setting, its students have numerous opportunities to relate what they learn in the classroom to the world outside the campus, and to share their experiences with fellow students and professors.

When such an urban institution is operated on the Cooperative Plan of Education—in which students alternate regular periods of classroom study with periods of paid employment in positions directly related to their academic major—the opportunities are multiplied even further. This is what Northeastern University has to offer.

Through the unique mix of work and study, Northeastern students are not only widening their own career horizons, but are also involved in activities of great benefit to others. You might find a Northeastern student singing in the chorus for a Boston opera performance, doing research at the Boston Athenaeum or Massachusetts Historical Society, tutoring Spanish-speaking residents in English, or teaching physically handicapped children to swim.

What type of student is this so-called "co-op"? Our experience has shown that the great majority of them are career-oriented, with their goals already clearly defined; if they have not reached that point as yet, they are keen enough to seek an educational experience best suited to help them do so. Co-op students place a high value on education, and particularly on one which prepares them for vocational or professional career opportunities. They have a deep appreciation of the value of the off-campus experience, and regard it as a significant part of their overall educational processes.

Among today's college students, the co-op is indeed fortunate. He is able to take advantage of an educational system which has a built-in financial aid feature of great benefit to him. Without it, he might not ever have gone to college. His academic curriculum is relevant, innovative, and individualized. His off-campus experience gives him a career head start on his counterparts at traditional institutions, and he is generally able to command a higher starting salary in his first job after graduation.

The co-op student has a coordinator who meets with him frequently to discuss his educational program, his career objectives, and his personal problems. Through such personalization of the educational process, the student's motivation is enhanced, both in class and on the job, and he develops skills in human relations which would otherwise be impossible.

Today Northeastern University is the world leader in cooperative education, as well as its prime consultant for other institutions interested in adopting the system. Many of its cooperative employers are located in Boston, although there are numerous others in urban centers from New York to California. Cooperative positions are found in virtually every career area—the arts, science, technology, health, education, business, industry, research, communications, just to name a few.

As a prospective college student, you are no doubt wondering how to select an institution. During these times of increased social awareness you will probably wish to study in a college or university which is truly part of the world around it. To be in the mainstream of urban life, where the city and the man teach each other, I urge you to give Northeastern University your serious consideration.

ASA S. KNOWLES

Contents

A Message from the President	3
Part I About Education	7
A Message from the Dean of Admissions	13
Part II The Academic Programs	15
Boston-Bouvé College	17
College of Business Administration	27
College of Criminal Justice	37
College of Education	41
College of Engineering	49
College of Liberal Arts	65
Lincoln College	89
College of Nursing	97
College of Pharmacy and Allied Health Professions	103
ROTC	117
Part III The Particulars of Education	121
Department of Admissions	122
General Requirements for Entrance	123
Applying for Admission	126
Expenses	129
Financial Aid	132
Scholarship Programs	133
Student Loan Programs	135
Part-Time Work	136
Housing	137
Student Activities	137
Department of Athletics	143
Freshman Orientation Programs	144
Counseling and Testing Center	144
Faculty Advisory System	145
Part IV The Pillars of Education	149
The University Library	151
Learning Resources	152
Research	152
The Computation Center	153
Part V Freshman Course Descriptions	155
Map of the Main Campus	176
Freshman Academic Calendar 1972-73	Inside back cover
Admissions Application	Insert at back

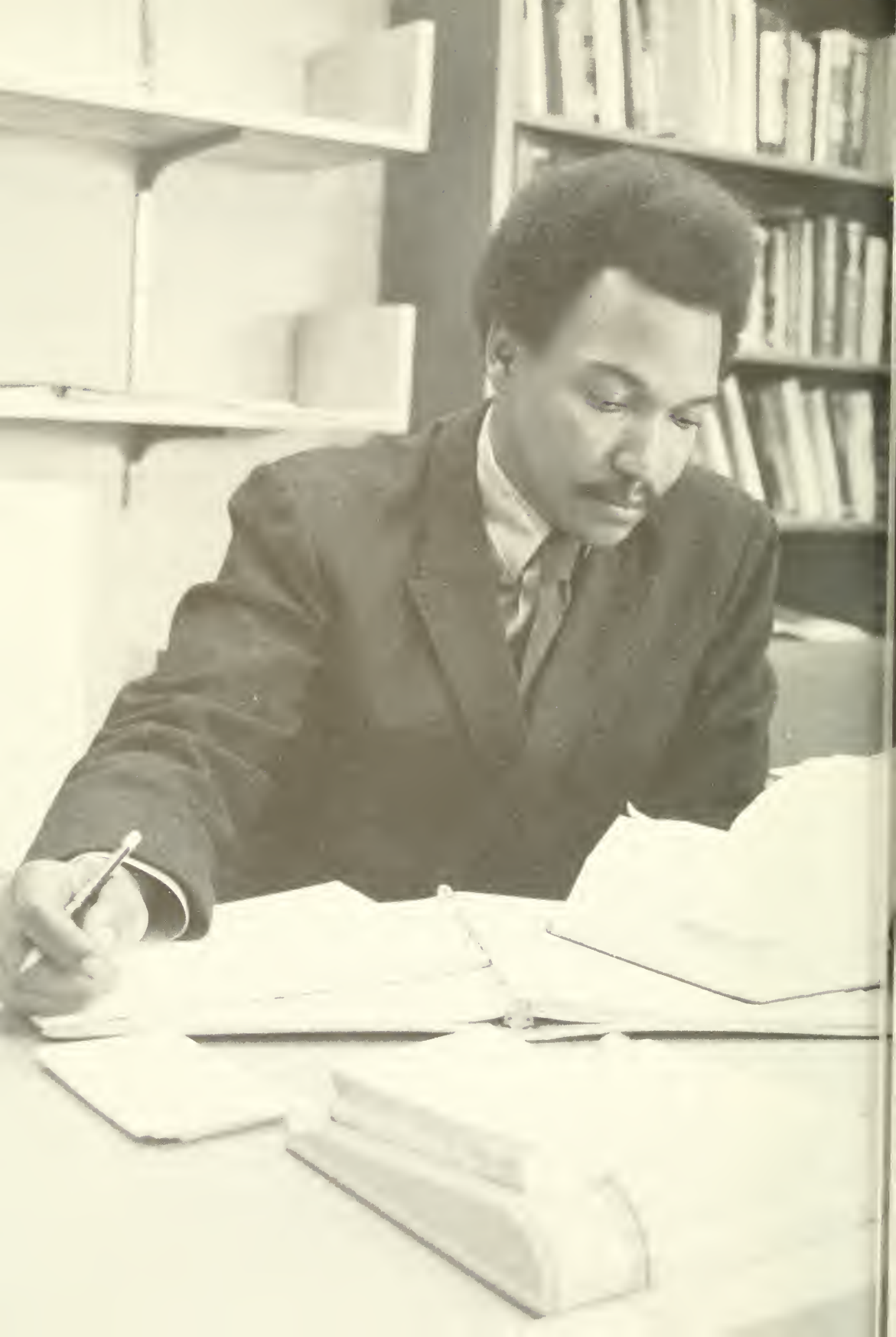
Tuition rates, all fees, rules and regulations, courses and course contents are subject to revision by the President and Board of Trustees at any time.

We hope that you will enjoy reading Introducing Northeastern University. This publication has been designed to help you in your educational and career planning, and to provide the kind of information you will need as an applicant for admission.

Quite naturally, we are enthusiastic about what Northeastern can offer you: an attractive combination of an exciting urban location, fully accredited programs of study in the Undergraduate Colleges, and unique learning experiences provided by the Cooperative Plan of Education. Northeastern University is now recognized as the international center for cooperative education. Through the Cooperative Plan, now being adopted by increasing numbers of colleges and universities, you will profit from challenging employment in a wide variety of fields of work.

We encourage early application for admission, and we hope that we can be of service to you as you make plans to continue your education. Your admissions application may be found at the back of this catalog.

**The Committee on Admissions
Department of Admissions
Northeastern University
360 Huntington Avenue
Boston, Massachusetts 02115
Tel. (617) 437-2200**



part 1

About Education

The Philosophy of Education

Northeastern has never forgotten its original purpose: to offer an education to all qualified students who possess both the desire for additional knowledge and the determination to acquire it in spite of possible hardships.

The University's long experience in offering a realistic type of education that provides an opportunity for productive work as a part of the total educational experience is particularly significant today, since Northeastern is fully aware of the importance of bringing its full resources to bear in helping to solve monumental—and universal—social problems. It has also made it possible for many additional members of minority groups to obtain an education.

Northeastern's location in Boston and the fact that it is the largest Cooperative Plan university in the world are significant factors which provide opportunities for student involvement in areas of national concern. For example, undergraduates have cooperative work assignments in such areas as air pollution research, rehabilitation, medical research, social service, environmental studies, and law enforcement. Student activities, too, offer a chance to "be where the action is": namely, in a wide variety of community-action programs, many of which help handicapped people, ghetto residents, and minority groups.

Today's socially conscious and alert students often wish to continue their education on the graduate level. In response to this desire, Northeastern has extended its Cooperative Plan to some areas of graduate education. One example is the School of Law, which stresses a curriculum substantially shaped around the significant social issues of contemporary society.

Many prominent educators, including those who are graduates of traditional, non-Cooperative Plan schools, are now urging that *all* college students have opportunities for on-the-job experience before graduation. These educators realize that the practical experience thus gained can complement college curricula.

Thus by alternating between classroom instruction and cooperative assignments, a Northeastern student is in a much better position to examine, to doubt, and to explore than his counterpart at other educational institutions. By constructive criticism he can justify the opinions he has

formed. He sees society not for what it is, but for what it can be, and is determined to help his country reach its full potential.

This is the challenge of opportunity which Northeastern provides. It is the challenge of the Age of Social Conscience which is being met effectively by its students and graduates.

The Problem of Education

“To teach them to think: that is the problem. It is impossible, today, for any school, undergraduate or professional, to equip its students with all the knowledge they will need to become competent” in their special fields of endeavor. “On the other hand, it can provide its students with a chance to discover something with which, on their own, they can live an extraordinary life: their ability to think.”

Since 1898 Northeastern has helped young men and women to think—to think in the classrooms; to think in the laboratories. But the development of their ability to think for themselves, to weigh all sides of an issue or problem, and to analyze, has always been due, in large part, to the Cooperative Plan of Education.

Under this plan you and your classmates will learn to think—to think on the job as well as in the classroom.

If your goals are well defined, cooperative education can give you the opportunity to obtain practical experience in your field. Theories learned from books and classroom discussions can be put into actual practice.

If you are still considering alternate career paths, cooperative education can provide the opportunity to test your ideas and help you decide. Observation of career fields through your experience on co-op adds a new dimension to helping you choose your career.

Your various cooperative work assignments will speed your progress in the art of thinking for yourself.

The Plan of Education

The Cooperative Plan is a dynamic system of education which helps to fit you in your career and personal development. It requires both concentrated study and hard work, but its rewards for you are many.

Upon graduation you will not only have a degree, but also a substantial amount of experiences to offer your potential employer. You’ll find out just how important these experiences are when you begin your job interviews for after-graduation employment.

The “Co-op Plan” demonstrates that practical experience, when combined with excellent classroom instruction, challenges you to your greatest effort. In many instances, you will earn enough money to defray the cost of your tuition, books, and incidentals.

The Cooperative Plan

After your freshman year you will alternate periods of classroom attendance at Northeastern with periods on cooperative assignments. With

the exceptions noted below, it will take you five years to complete degree requirements.

In the College of Liberal Arts each of the majors offers the option of a four-year plan in which eight quarters of upper-class study are completed in three upper-class years.

All programs in Boston-Bouvé College are on the five-year Cooperative Plan.

The Associate Degree program in the College of Nursing is completed in three years, with cooperative experience provided during the second and third years. Students holding an L.P.N. designation who wish to apply their credits to the Associate Degree will complete their program in two years.

John Ruskin once wrote: "Education is leading human souls to what is best and making what is best of them . . . the training which makes men happiest in themselves also makes them more serviceable to others."

Under the careful personal guidance of your faculty advisers and coordinators at Northeastern and the supervisors of your various cooperative work assignments where you are employed, you will be assisted in discovering the type of career which will bring you most genuine satisfaction . . . the kind which will make you happiest and most serviceable to your community and nation.

The Place

From what was once a barren circus ground and baseball field, the Northeastern University campus of today has emerged on Huntington Avenue in Boston's Back Bay.

Today the University campus is one of the city's finest and most modern centers of education. Under the Diamond Anniversary Development Program, a master plan was drawn up in 1961 for the expansion of facilities on this 48-acre site, with completion scheduled for 1973, Northeastern's 75th anniversary.

Many steps have been taken to implement the plan: two women's dormitories, Speare Hall and Stetson Hall, housing 1,200 coeds; the addition to the Carl Stephens Ell Student Center, giving the students a much-needed cafeteria and expanded areas for extracurricular activities; Mary Gass Robinson Hall, housing the College of Nursing, the Division of Health Science of the College of Pharmacy and Allied Health Professions, and the Riesman Biology Center, as well as physical therapy classrooms, offices, and laboratories, and educational television facilities; the Sarkis and Vosgitel Mugar Life Sciences Building, housing the College of Pharmacy and the Departments of Biology, Chemical Engineering, and Psychology; and the Charles A. Dana Research Center, providing facilities for the research programs of the Departments of Physics and Electrical Engineering. The Edward L. Hurtig Chemistry Building was opened in 1968 and the Asa S. Knowles Center for Law and Criminal Justice opened in 1969.

Ethel G. and Reuben B. Gryzmish Hall, the section of the Knowles Center in which the School of Law is housed, was opened in 1970. Gryzmish Hall is a building especially designed for the School's distinctive program of

legal education. It contains a law library, student lounge, moot courtroom, jury room, judge's chambers, classrooms, and offices.

John A. Volpe Hall, the second section of the Knowles Center, is the headquarters of the College of Criminal Justice. Volpe Hall was dedicated in the spring of 1972.

Two facilities for Boston-Bouvé College have also been opened: one, Charles and Estelle Dockser Hall, a five-story structure housing classrooms, laboratories, libraries, gymnasium, dance studio, recreation center, and faculty offices; and the other, the Barletta Natatorium, consisting of a swimming pool, four handball courts, and a practice tank for the crew.

Another facility for Boston-Bouvé College, the Warren Center for Physical Education and Recreation Education, has been developed in Ashland, Massachusetts, to serve as an outdoor laboratory for students majoring in Physical Education, Recreation Education, Physical Therapy, and Health Education.

Freshmen in the Colleges of Liberal Arts, Criminal Justice, Education, Business Administration, and Engineering who prefer a suburban atmosphere may attend classes on the 165-acre Suburban Campus, located near Route 128 in Burlington, Massachusetts. After their first year, they will transfer to the Huntington Avenue Campus in Boston.

Prospective students will find another good reason for attending Northeastern besides the wide range of programs and facilities which it offers its students. This is the location of the main campus. In very few instances are educational institutions situated in such a varied cultural and social environment as Northeastern.

Within walking distance from the University are the Museum of Fine Arts, Symphony Hall, the Gardner Museum, the New England Conservatory of Music and Jordan Hall, and the Boston Public Library. Upon boarding a bus or the subway, students can easily travel to the theatre district, where pre-Broadway plays are often "tried out" and smash hits staged. Among the numerous cultural organizations that call Boston home are the Boston Symphony Orchestra, the Boston Pops, the Boston Ballet Company, The Opera Company of Boston, and the Theatre Company of Boston.

Boston offers students every range of shopping facilities, from tiny boutiques to huge department stores, all within a short distance of the University. And nearby restaurants serve everything from soul food to sukiyaki for that special weekend date.

The Faculty

It has been said that "the most essential thing in the work of education is that sympathetic touch of life on life. It is by that fine process that personality is developed, matured, and enriched in all the younger candidates for human existence."

One reason for the success of the Cooperative Plan at Northeastern University is the "touch of life on life" which is made possible by the close association between more than 700 scholars on the faculty of the Basic Colleges and their students. This is made possible by the University's advisory system. Although these scholars represent the best in American education and are alumni of distinguished colleges and technical institutions, Northeastern insists that their achievements in every case be supplemented by such important factors as enthusiasm for teaching, ability to stimulate intellectual and scientific curiosity, and genuine understanding of young people.

As a student at Northeastern you will have the advantage of studying under a faculty chosen for these qualities, and through the time-tested advisory system you will be certain always of seasoned and sympathetic guidance and assistance in developing your particular talents.





A Message from the Dean of Admissions

To put into words the true story of Northeastern University and the challenging opportunities which it presents to young men and women is a very difficult task. As one student said: "You almost have to live it in order to appreciate it."

A recent full-page news story carried the headlines: "Northeastern's Co-op Program Comes Into Its Own—A Model For Nation." But even this fails to tell the full story of the excitement of our educational programs. It can be sensed in the comments of a student as he returns from his cooperative work assignments and shares his experiences with a close friend. It can be appreciated by observing a student as she relates to children with special learning disabilities, or by watching one who works as a team member on a problem in environmental engineering. It can be understood when one talks with a student about the challenge of his job at the National Archives in the Nation's Capital or at the famed Oceanographic Institute at Wood's Hole, Cape Cod.

Northeastern University is cooperative education at its best. Our students seek relevancy and involvement in their educational experiences, and they find these qualities as they are able to relate the theory of the classroom to the actual world of adult employment. In so doing, they gain a good measure of financial independence through salaries paid for services rendered. Cooperative education has, in fact, prospered because of its uniqueness, its relevance, its built-in financial aid feature, and its direct orientation to the individual student. No other type of higher education can make these claims.

Each fall about 3,500 freshmen arrive on this campus. Approximately one half are resident students and one third are girls. They come to us from 30 states and 40 foreign countries. They represent a wide range of student aptitudes and career interests. Together they participate in a student activity program of social, musical, dramatic, literary, and athletic events which contribute greatly to enjoyable and meaningful student life.

The University is located in the very heart of what is perhaps the greatest concentration of college and university students in the world. They make extensive use of the cultural and recreational opportunities available in the City of Boston and its suburbs. It is an exciting place in which to prepare one's self for the challenges of tomorrow. Yet, in the midst of excitement and change, Northeastern places the emphasis where it properly belongs—upon the student.

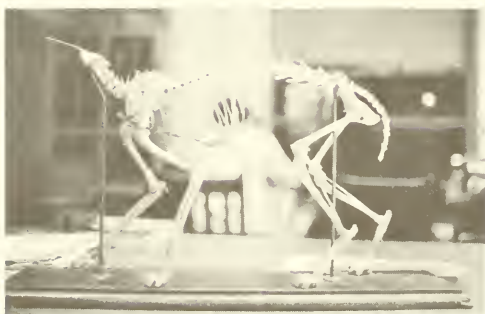
We cordially invite you to visit our campus. Please let us know if we may assist you in your educational and career planning.

GILBERT C. GARLAND



part 2

The Academic Programs



Catherine L. Allen, Dean

Boston-Bouvé College

Boston-Bouvé College offers degree programs in professional education for both men and women in:

Health Education

Physical Education

Physical Therapy

Recreation Education

Programs

Each curriculum combines basic liberal education and professional preparation including related supervised field experience. The Cooperative Plan of Education of Northeastern University affords diversified opportunities for alternating terms of work and study beginning in the sophomore year in every department. All programs in the College are five years in length.

Aims

To meet demands for fully qualified personnel in Health Education, Physical Education, Physical Therapy, and Recreation Education, modern education seeks to develop the independent, self-reliant individual, liberally educated and professionally skilled, who is a socially responsible and contributing member of society.

Facilities

Dockser Hall houses administrative and faculty offices, libraries, gymnasium, dance studio, physiology of exercise laboratory, classrooms, locker and shower facilities; and the Department of Recreation Education with the community recreation laboratory, cultural arts area, seminar and research center. Within the Barletta Natatorium the swimming pool, weight room, handball courts, offices, and shower and dressing facilities are located.

The Physical Therapy Department is located in Mary Gass Robinson Hall. On the third floor are the physical therapy faculty offices, a library, classrooms, and laboratories. One of the laboratories is specially designed to simulate a modern physical therapy department and is well equipped for the practice of clinical procedures. These rooms are wired for closed circuit television to carry programs pertinent to the profession. This is also true of Dockser Hall.

Degrees

In Health Education, Physical Education, and Recreation Education, the degree of Bachelor of Science in Education is awarded; and in Physical Therapy, the Bachelor of Science in Physical Therapy. All programs are accredited.

Your Freshman Year in Boston-Bouvé College

The academic curriculum in your first year of college is planned primarily to provide basic foundation and knowledge in the physical and social sciences, the humanities and arts, although these courses and those offered in each of the major fields, Health Education, Physical Education, Physical Therapy, and Recreation Education, differ because of increasing specialization in upper-class years. Later, you have the opportunity to select electives which enrich your program and help you to recognize and develop other talents and interests.

Your cooperative work assignments bring insight and responsibility as you apply your knowledge, skills, and resources acquired in both the general and professional studies of your college education. The abilities to work well with others and to appreciate the associations are important attributes in your profession.

Upper-class students and graduates say that the most exciting challenge of their college careers is experienced when the field work assignments, whether recreation leadership, student teaching, or clinical practice, reveal the significance of the role of professional service.

HEALTH EDUCATION

Description

Health education is a teaching profession. The primary goal of the program in Boston-Bouvé is the preparation of professional students for careers as teachers of health education in elementary and secondary schools, colleges and universities, and in community centers and agencies.

The way of life that an individual chooses in health matters will affect all that he does and dreams of being. The health educator teaches people about health concepts and health maintenance throughout life; the use of health services; active community involvement in health; the solution of individual, family, and community health problems; the fulfillment of potential; and the living of a fuller, better, more useful life.

Your Program of Study

Your program of study includes the liberal arts and sciences concentrated in the first two years, with a major concentration in the last three years on professional courses, student teaching, or field experience. In the third year a student may select either the School Health or Community Health track.

Cooperative education, beginning in the sophomore year (in alternate periods of paid employment and study), has exciting possibilities for placement in health agencies, schools, community and continuing education centers, housing complexes, and halfway houses.

Special Requirements

Uniforms. All Health Education majors are required to purchase an activity uniform for physical education. Information is furnished at the appropriate time by Boston-Bouvé College.

Student Teaching/Field Experience. The requirement in supervised student teaching in the School Health track or supervised field experience in the Community Health track is completed during one quarter of the senior year.

Your Future

As a graduate, you will be qualified to teach in schools at all levels and/or in community centers and agencies.

The need for health educators is increasing with constant requests for highly qualified personnel. There is growing concern about problems of society: drugs and alcohol, smoking, family life and sex education, the environment, nutrition, consumer education, and other aspects related to the quality of life. Health educators are concerned about such things; in fact, health and education are inseparable.

Sample Freshman-Year Program of Studies in Health Education

<i>First Quarter</i>	<i>Second Quarter</i>	<i>Third Quarter</i>
12.101 General Chem.	12.102 General Chem.	10.104 Mathematics*
18.141 Biology	18.142 Biology	Gen. Studies Elect.
50.116 Social Science I	50.117 Social Science II	Gen. Studies Elect.
65.110 Foun. Health Educ. BBC elective	Gen. Studies Elect. Physical Educ.	19.102 Bas. Psych. Phys. Educ.

**Students with a mathematics proficiency may elect a general studies course.*

In addition to the above courses, a student may elect to take Basic ROTC.

Please see back of catalog for full course descriptions.

PHYSICAL EDUCATION

Professional Program

The professional program in Physical Education is designed to prepare specialists capable of developing the materials and methods appropriate to teaching physical education in public and private schools at all levels: elementary, secondary, and college. Its graduates are qualified as athletic coaches, physical education teachers, directors of athletics, supervisors of physical education, and leaders in YMCAs, YWCAs, and other youth organizations.

Students majoring in this program receive a strong background in education and liberal arts. Elective hours are required in each of the areas of science, social science, and humanities. Specialization in Physical Education includes such courses as History, Philosophy, Principles, Curriculum Development, and Class Procedures, Measurement and Evaluation, Kinesiology, Exercise Physiology, and Perceptual-Motor Development. Students are well grounded in the techniques of coaching the various individual, dual, and team sports, and in adapting these activities to the needs of the handicapped. Because of the close and overlapping relationship of physical education, health, and recreation, Physical Education majors may take courses in these areas and are also afforded laboratory experiences in them.

The development and demonstration of personal skill in performance and teaching are an integral part of the professional program. Each student will be expected to demonstrate a level of personal proficiency in one activity from each of these areas: aquatics, dance, gymnastics, racquet sports, individual activities, and team sports. The degree of skill may be demonstrated through proficiency testing or by taking appropriate courses from among electives offered by Boston-Bouvé College. Major students are assigned supervised student teaching responsibilities in elementary and secondary schools throughout the Greater Boston area. In addition, students increase their experience with children through their cooperative work assignments and as counselors in summer camps.

Special Requirements

Approximately \$85 is required for physical education uniforms. Fees may be assessed in courses requiring highly specialized equipment, supplies, or off-campus facilities. In the spring quarter of the freshman year there is a required two-week resident program at the Warren Center. An additional fee is charged for room and board.

Student Teaching—The requirement of student teaching is completed during one quarter of the senior year. Students are assigned to public schools in the Greater Boston area.

Resident Camping—Students are scheduled for their resident camp counseling experience during the third- or fourth-quarter summer quarter. This program is conducted at the Warren Center in Ashland, approximately 25 miles west of the Huntington Avenue Campus in Boston.

Cooperative Education—Under the Cooperative Plan of Education, majors receive unique experiences after the freshman year working in Boys’ Clubs, YMCAs, YWCAs, hospitals, and community recreation programs, or under the direction of master teachers in public schools.

Your Future

As a qualified graduate, you will be certified for positions in physical education according to your individual career preference: teaching in elementary and secondary schools, colleges or universities; coaching or directing sports and athletics; or conducting seasonal camping and year-round physical activity programs.

**Sample Freshman-Year Program of Studies
in Physical Education**

<i>First Quarter</i>	<i>Second Quarter</i>	<i>Third Quarter</i>
62.201 Human Movt.	30.114 English	62.249 Phys. Science
30.113 English	18.142 Biology II	Found.
18.141 Biology I	50.117 Soc. Sci. II	62.203 Group Dynam.
50.116 Soc. Sci. I	Gen. Studies Elect.	Practicum
Prof. Skills Elect.	Prof. Skills Elect.	62.215 Observ. of Stud.
		Behavior
		65.130 Health Prob. of
		The Coll. Stud.
		62.206 First Aid
		Prof. Skills Elect(s).

In addition to the above courses a student may elect to take Basic ROTC.
Please see back of catalog for full course descriptions.

PHYSICAL THERAPY

Description

The qualified physical therapist is a highly skilled member of the health professions concerned with the total rehabilitation of the patient and contributing to the present-day challenge of comprehensive medical care. He (or she) carries out evaluation and treatment procedures which are carefully planned and directed toward helping the patient regain functional independence. Treatment procedures include the use of heat, cold, massage, hydrotherapy, electrotherapy, and therapeutic exercise for the specific purpose of restoring the disabled individual to the optimum of his capacity. In addition, the responsibilities of a physical therapist may include health planning and community service. The qualified physical therapist administers physical therapy only upon referral by a licensed physician.

Your Program of Study

Your program of study includes the liberal arts and sciences as well as professional courses. Major emphasis is placed on liberal arts and sciences in the first two years and on professional preparation in the last three years.

Your professional studies include Anatomy, Kinesiology, Physiology, Clinical Medicine, Pathology, Physical Therapy Procedures, and supervised practical experience in various hospitals and clinics.

Lecturers from Tufts University School of Medicine and the New England Medical Center, as well as from the many medical and social agencies in the Boston area, augment the professional staff in the approved Physical Therapy program. Graduates are eligible to take the state examination for registration.

Special Requirements

Uniform. A basic activity uniform is required for Physical Education and Physical Therapy laboratory classes beginning in the freshman year. White uniforms are required at the appropriate time for supervised clinical practice.

Your Future

The need for registered physical therapists is critical, and the opportunities for employment are unlimited and challenging. Positions are available in general hospitals, children's hospitals, university hospitals, rehabilitation centers, schools or centers for crippled children, and community, state, and governmental agencies.

In addition, there are increasing opportunities in teaching and research in physical therapy.

Sample Freshman-Year Program of Studies in Physical Therapy*

<i>First Quarter</i>	<i>Second Quarter</i>	<i>Third Quarter</i>
10.104 Fund. Math.	10.105 Fund. Math.	12.107 Gen. Chemistry
18.141 Basic An. Biology	12.106 Gen. Chemistry	18.142 Basic An. Biology
30.113 English	30.114 English	64.113 Intro. Ph. Th.
65.129 Health Education	64.111 Intro. Ph. Th.	Elective
Physical Educ.	Physical Educ.	

In addition to the above courses a student may elect to take Basic ROTC.

Please see back of catalog for full course descriptions.

**Prerequisite subjects are concentrated in the first two years.*

RECREATION EDUCATION

Description

The recreation educator is a qualified, broadly skilled member of the community team. He or she serves boys, girls, and adults in a recreation center or a hospital; teaches crafts in a settlement house; develops year-round enrichment programs in school systems and agencies for afternoon, evening, weekend, and summer fun and learning; works in service clubs on military bases or in the Peace Corps or the Red Cross; organizes employee and family recreation for industry and business, including vacation periods; teaches children and youth in recreation for the mentally retarded; supervises the school camping program; or directs a resident or day camp.

Your Program of Study

The recreation educator builds tastes and talents, interests, skills, appreciation, and knowledge; is sensitive to the needs of people; is a leader dedicated to service.

Your program of study as a Recreation Education major is based in the liberal arts and sciences, with professional education beginning in the freshman year. Academic and professional preparation continue as parallel programs, with electives in areas of interest, supervised field experiences in selected settings, and cooperative opportunities.

Special Requirements

Uniforms. All Recreation Education majors are required to purchase professional activity uniforms. Information is furnished at the appropriate time by Boston-Bouvé College.

Outdoor Education and Camping are integral parts of the curriculum, with both resident and year-round opportunities in the out-of-doors.

Your Future

Cooperative Education offers excellent employment opportunities in schools, hospitals, social agencies, and in community recreation settings.

Field Experiences in the junior year consist of selected placement, qualified supervision, and graded evaluation in institutions, schools, and hospitals, in agencies, and in community recreation settings.

Sample Freshman-Year Program of Studies in Recreation Education

First Quarter

18.141 Basic Biology
29.106 Speech
 Fundamentals
50.111 Social Science
63.120 Orient. Rec.
63.121 Rec. Skills I

Second Quarter

18.142 Basic Biology
30.113 English
50.112 Social Science
63.122 Rec. Skills II

Quarter 3A

63.125 Outdoor Educ. &
Camp Leadership

Third Quarter

30.114 English
50.113 Social Science
63.123 Rec. Skills III
65.129 Health Education

In addition to the above courses a student may elect to take Basic ROTC.

Please see back of catalog for full course descriptions.



Accounting

Finance and Insurance

Industrial Relations

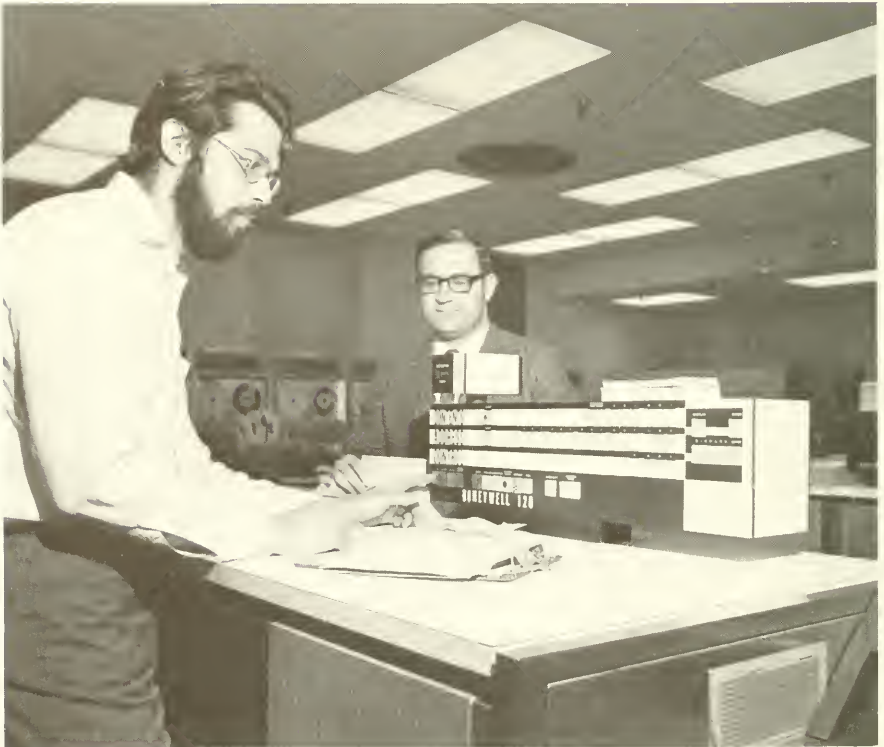
International Business

Management

Marketing

*Small Business
Management*

Transportation



James S. Hekimian, Dean

The College of Business Administration

The College of Business Administration offers programs of study to prepare men and women for positions of administrative responsibility in business, governmental, and other organizations. Preparation for administrative positions requires a subtlety of mind in the recognition and solution of problems. In order to accomplish this, the business student is given a broad understanding of business and organizational problems, as well as first-hand knowledge of effective methods of solving them. In addition, the broader scope of the business firm must be understood, especially its role and responsibility in community, national, and international relations.

Aims

In keeping with the current trends in collegiate education, the educational policy of the College has the following aims:

1. To develop attitudes and ideals that are ethically sound and socially desirable.
2. To cultivate an appreciation of the social, political, and economic developments to which the business firm must adjust and adapt.
3. To develop the habits of accurate thinking that are essential to sound judgment.
4. To provide an opportunity to develop a specialization in business in accordance with the student's interests and talents.

The Cooperative Plan is particularly helpful to the student in attaining these goals. To accomplish these objectives, the fundamental skills and tool subjects are dealt with in their relation to the broader context of the business firm.

The upper-class program of study assimilates the practice of modern business management and administration with elective courses in Liberal Arts and other non-business areas.

The courses in the curriculum fall into four broad categories: (1) required liberal arts courses; (2) business administration core courses; (3) courses in several business administration concentrations; and (4) electives in business administration, liberal arts, or other nonbusiness areas.

Students may decide to concentrate in Accounting, Finance and Insurance, Industrial Relations, International Business, Marketing, Small Business Management, or Transportation; or they may structure their own concentrations suitable to their specific educational goals.

Method

The College makes use of the problem and the case methods of instruction in addition to the lecture and recitation system. Students should learn to analyze every proposition, to challenge unsupported assertions, to think independently, and to support their thinking with logic and facts. Hence, concrete problems and cases which executives have faced in accounting, marketing, organizing, and the like constitute a large proportion of classwork in the upper-class years.

Degree Granted

The Bachelor of Science in Business Administration degree is awarded to qualified candidates.

Your Freshman Year in the College of Business Administration

You will find that the freshman year is devoted primarily to a survey of the political and social institutions that significantly influence the conduct of business and nonbusiness organizations. You will also be introduced to a basic tool of business—accounting—and have an opportunity to choose electives from the humanities, behavioral and social sciences, and natural sciences, or from history and political science.

Throughout your upper-class programs of study other courses in the liberal arts, such as philosophy, literature, history, political science, psychology, and sociology, will be available as electives. Therefore, in addition to the depth of instruction provided in a business concentration, you will also be able to take numerous courses in the liberal arts areas. Courses in other colleges within Northeastern University will also be available as electives.

Through the Cooperative Plan, Business Administration students develop first-hand knowledge of management practices, together with an understanding of the basic principles of business which have been studied in the classroom.

Your Future

A concentration in Accounting will prepare you for professional public accounting, as well as for positions in private industry or government service.

The concentrations in Finance and Insurance, Industrial Relations, International Business, Management, Small Business Management, and Transportation, when combined with the experiences gained in both business and nonbusiness organizations on your cooperative work assignments, will give you the experience and educational background for almost any type of administrative position for which your interests and abilities qualify you.

The business training and experiences which you undergo during your eight cooperative work periods will be most important factors in helping you to determine the specific type of work and kind of organization with which you would like to be associated after graduation.

An increasing number of qualified graduates of the College of Business Administration see fit to continue their formal education in graduate programs in order to extend their professional and research abilities to better serve employers in business and industry or to prepare themselves for careers in college-level teaching.

Students who plan to continue their formal education by enrolling in a law school after graduation will find that the undergraduate program in the College of Business Administration provides an excellent foundation. Many careers in law are directly involved in the business world: in large corporations or in private practice. The College's curriculum provides a broad understanding of the business environment, as well as specific skills in the problems of operating a business in the socio-legal environment.

While the Association of American Law Schools does not recommend particular courses or curricula for prelegal students, it does advise that undergraduates build skills in comprehension and oral expression; critical understanding of the human institutions and values with which the law deals; and the development of the creative power of thinking. The flexibility and liberal arts content of Northeastern's Business Administration curriculum allows a student to fulfill these requirements, while at the same time acquiring a specialized skill in and knowledge of the field of business management.

**Sample Freshman-Year Program of Studies
in the College of Business Administration**

<i>First Quarter</i>	<i>Second Quarter</i>	<i>Third Quarter</i>
19.105 Psychology	19.106 Psychology	Liberal Arts
Liberal Arts	10.124 Math.	Elective
Elective	Liberal Arts	10.125 Math.
30.113 English	Elective	30.114 English
49.100 Intro. to Business	41.111 Accounting	41.112 Accounting

In addition to the above courses a student may elect to take Basic ROTC.

Please see back of catalog for full course descriptions.

ACCOUNTING

Description

Accounting encompasses a broad range of activities. These include all phases of record-keeping, internal reporting, financial planning, cost control; the design and installation of systems and procedures; and the application of electronic and other modern business methods to these activities.

Type of Work

Accounting is the second largest field of professional employment for men. Of more than 400,000 accountants and auditors engaged in professional accounting work, over 60,000 are certified public accountants who have passed rigorous examinations prescribed by law in their states. The certified public accountant has been called "the guardian of the conscience of the business community."

Your Program of Study

Accountants in any of the three major fields of employment—public, private, and government—may specialize in such areas as auditing, tax work, cost accounting, budgeting and control, or systems and procedures. The Federal Government employs accountants as Internal Revenue agents, investigators, and bank examiners, as well as in regular accounting positions.

Accounting, the nerve center of business today and one of the fastest-growing professions in the United States, is an exacting field. It seeks men and women who like to solve mathematical problems, who enjoy working with statistics, who are accurate, and who enjoy the process of reasoning and interpretation which characterizes accounting.

You will spend the first year surveying the political and social institutions that underlie the conduct of business. As you approach your second year, you will consult with your faculty adviser and your coordinator from the Department of Cooperative Education about your work assignment.

In the Accounting concentration, your courses may include such technical subjects as Accounting Theory and Practice, Cost Accounting, Auditing, and Taxes, along with Economic Problems, Statistical Analysis, Government Regulations, and General Studies.

MARKETING

Description

Without successful marketing and advertising, the products of industry remain unsold. More and more companies are finding that today's tempo of progress and high levels of production require up-to-date techniques of marketing to generate an increasing volume of sales.

Your Program of Study

A business organization not only designs and produces products, but must also market and sell them—to manufacturers, to wholesalers, to retail stores, and to consumers. With a concentration in Marketing, this is what you will study in class.

Weekly meetings of the Advertising Club and the student chapter of the American Marketing Association give you an opportunity to further your interests in these areas and to discuss issues with leaders in these fields.

In a variety of courses, by lectures and class discussion, through analysis of case material and preparation of written reports, you will learn how goods and services are marketed.

Your Future

You will find marketing a challenging field . . . one that puts responsibility squarely on the shoulders of the individual . . . a field that rewards maturity of judgment together with effectiveness in getting results . . . a field that increasingly leads to executive and top administrative posts. The Cooperative Plan is particularly valuable in preparing young men and women for careers in marketing.

FINANCE AND INSURANCE

Aims

The Finance and Insurance concentration of Northeastern's College of Business Administration has two chief objectives:

1. To provide a series of courses that will acquaint you with the technical aspects of all fields of finance and the fundamentals of insurance, and
2. To provide a broad, general knowledge of the field of business.

Type of Work

Today there is a real need for young men and women who have been well trained in investment analysis and investment management. Other opportunities may be found in banking, with brokerage firms or with investment trusts, in business forecasting, or with an insurance company. Business leaders are seeking for administrative positions young men and women not only competent in the basic skills of communication and in technical knowledge, but also endowed with the knowledge and skills of finance and management.

Northeastern University is ideally located to train young men and women for work in these important fields. The City of Boston, a leading center of finance and insurance, does a great volume of trust work—the managing of estates and investment programs for other people.

Your Program of Study

As a sophomore, you will study Introduction to Finance, together with introductory courses in other business fields. Specialization will occur in the upper years, as you study advanced courses in insurance, investments, and security markets. Other courses, particularly in the broad field of economics, are available to provide a well-rounded education.

Your Future

Financial institutions perform indispensable services for present-day business and industry. A list of these institutions must include banks, insurance companies, investment houses, credit concerns, financial exchanges, business forecasting organizations, financial service institutions, mortgage companies, national and local real estate brokerage firms, and appraisers.

There are career opportunities in all areas of business, industry and government, where financial planning and operation are a vital necessity.

INDUSTRIAL RELATIONS

Aims

Industrial relations personnel, working closely with engineers and production supervisors, are primarily concerned with workers as people. They must, therefore, become skillful in the art of human relations. The program in Industrial Relations will lay a sound base for the development of this skill.

Type of Work

Industrial Relations is closely related to Management. If you were to choose this program of studies, you might be employed as a supervisor in job analysis or placement, employment interviewing, industrial accident prevention, public relations, labor-management relations, training or recreational programs for employees, or psychological and aptitude testing. You might supervise an employee suggestion system, or direct a company training program. Responsibility for the development of industrial publications is usually carried by members of the industrial relations staff.

The day is past when "anyone" can direct labor-management relations. Therefore, a host of opportunities exists in this field, the human side of conducting a business. Both unions and management offer a wide selection of positions in personnel, bargaining, wage administration, and public relations. The government, too, has many openings for men and women who have taken this program of studies.

Your Program of Study

After the freshman year your program of studies will include such courses as Labor Economics, Personnel and Industrial Relations, Collective Bargaining, and Labor Law.

INTERNATIONAL BUSINESS

Aims

Several factors in recent years have contributed to a rapidly increased need for qualified people in the field of international business. The growth of multinational firms, expansion of international trade, and the growth of regional international trading blocs have created a shortage of skilled managers who are qualified in analyzing the complexities of international business problems. This concentration aims at developing students to meet these management needs.

Your Program of Study

Students who choose this concentration will develop an understanding of the environmental, economic, political, and social constraints impinging on international business. They will also develop skills in analyzing the financial, marketing, and operational strategy of the multinational firm.

The curriculum of the College of Business Administration provides an opportunity for the student concentrating in International Business to complement his business studies with liberal arts electives appropriate to the understanding of international relations. These can include studies in the modern languages, political science, international economics, and the geography and history of the world's nation-states.

Your Future

Careers in international business are available in most companies which carry on trade or manufacturing operations in foreign countries. An increasing number of multinational firms are requiring that candidates for their top management positions have gained experience in international operations. Large banks and insurance companies also need managers who understand international business.

Students following this concentration may find employment opportunities both in the United States and in foreign locations. Needless to say, the opportunity for foreign travel is frequently available. The government, trade associations, and large unions also provide employment opportunities for students who have studied international business.

MANAGEMENT

Aims

The curriculum in Management is designed to appeal to you if your interests lie in the broad areas of business rather than in more specialized fields.

It seeks to encourage the breadth and depth of vision demanded for successful business leadership in a highly complex society.

Your Program of Study

As a student who concentrates in Management, you will study accounting as a tool of management rather than as a means of developing proficiency as an accountant. You will study several areas of marketing to gain a better appreciation of its role in business operations. Likewise, the role of a sound human-relations program in the modern business organization will be considered. In addition, you will study problems relating to the physical aspects of management: the plant, its facilities, its internal organization, and the problems involved in the production of goods and services.

The courses in Management vary a great deal in their content and in the way they are taught. Several courses of study pertain to theory and are conducted on a straight lecture basis. Other courses, especially in the last two years of college, afford an opportunity for research, new ideas, and self-expression. Together, these courses will provide a foundation for a successful career in management.

SMALL BUSINESS MANAGEMENT

Aims

The concentration in Small Business Management is offered to provide students who plan to operate their own businesses with an opportunity to develop skills necessary for the effective management of small enterprises.

Your Program of Study

Students following the Small Business Management concentration will take courses which will develop their ability to find and evaluate business opportunities, to secure adequate sources of funds, and to organize and manage the various facets of the small business: marketing, manufacturing, finance and control, and personnel.

Your Future

Small business management presents a student with the opportunity to prepare for a career in which he can be involved in the management of business while maintaining a significant degree of autonomy and independence. Some students will enter this career at graduation, or sometimes even before it. However, many find that first they will obtain experience through their cooperative work and postgraduate employment prior to establishing their own enterprise.

TRANSPORTATION

Description

The need for qualified people in the field of transportation and business logistics has increased rapidly in recent years. In the industrial setting, con-

tinued emphasis on cost control and the pressures of widespread distribution have created a demand for personnel who understand the dynamics of logistical function, involving inventory control, warehousing, and transportation, and the interaction of these activities with other functional operations.

Growing concern with the economic and service conditions of the transportation industry has created many governmental positions with Federal, state, and local agencies which are engaged in policy development and administration. Similarly, carriers such as airlines, railroads, and trucking companies are interested in hiring those familiar with the operational and regulatory-oriented aspects of their business. Employment opportunities may also be found in consulting and teaching.

Your Program of Study

Course offerings in Transportation and Business Logistics are sequenced so that students who desire only an introductory exposure to the field may take one or several courses as part of a broader business background. However, a sufficient number of courses will be offered to enable students to choose a concentration in Transportation and Business Logistics in preparation for a career in this field. By electing a specific combination of courses, students may tailor their program to meet the requirements of several of the previously mentioned occupations.





The graduate of the College of Criminal Justice must be prepared to judge objectively the many socio-economic problems inherent in the administration of justice in contemporary American society. Obsolete and intellectually antiquated methods of administering justice have no place in the modern world.



Norman Rosenblatt, Dean

The College of Criminal Justice

The College of Criminal Justice, first of its kind in New England and the only one in the nation operating on the Cooperative Plan of Education, opened in the fall of 1967.

Methods of police administration, law enforcement, forensic science, rehabilitation, and corrections are changing drastically to cope with contemporary developments; and those who intend to become professionally engaged in these important services, as well as in other areas of social and community service to society, now need much more formal education than in the past.

Aims

A grant of \$90,000 has been made by the Ford Foundation in partial support of the program. The purpose of the five-year curriculum is to prepare students for careers in law enforcement, corrections, rehabilitation, and delinquency prevention.

It is Northeastern University's hope and expectation that the College of Criminal Justice will make a substantial contribution to the education of professional personnel in these important services in the years ahead and thus will provide a real service to community, state, and nation.

Co-opportunities

After your freshman year, consisting of 36 weeks of full-time study, you will alternate periods of study at Northeastern with periods of paid employment in cooperative work assignments. You will find that a wide range of assignments will be available to you, including work in ballistics and

chemical laboratories, record and identification bureaus, planning and community relations groups, and a number of private and public agencies associated with problems of a criminal justice nature.

Most cooperative work opportunities are in New England, but there are also many elsewhere in Federal, state, and local agencies, as well as in private business and industry.

At the successful completion of your program, you will be awarded the degree of Bachelor of Science in Criminal Justice.

Your Program of Study

As shown below, you will study Political Science, English, Economics, Psychology, Sociology, and Criminal Justice as a freshman. You may also elect to take Basic ROTC Training or Physical Education.

In subsequent years you make take such professional courses as Criminal Investigation, Evidence and Court Procedure, Criminalistics, Corrections, Police-Community Relations, Criminal Law, Civil Liberties, Law Enforcement Administration, Rehabilitation, and Research Methods.

Your professional study will also include many liberal content courses, giving you a broad, general background in the liberal arts and behavioristic sciences.

Your Future

The College of Criminal Justice prepares young men and women for professional careers in law enforcement and corrections. The curriculum has been designed primarily for students interested in municipal and state police service and correction agencies. However, Federal agencies and industrial security operations in private industry also offer many challenging and rewarding opportunities. It is expected that a number of graduates will choose to pursue advanced study in academic fields such as social work, criminology, law, and public administration.

Sample Freshman-Year Program of Studies in the College of Criminal Justice

<i>First Quarter</i>	<i>Second Quarter</i>	<i>Third Quarter</i>
21.100 Principles of Soc.	19.105 Found. of Psych.	19.106 Psychology
30.113 English	22.101 Intro. to Pol. Sci.	22.102 Intro. to Pol. Sci.
39.115 Economics	30.114 English	39.116 Economics
92.201 Hist. of Crim. Just.	92.202 Hist. of Crim. Just.	92.203 Hist. of Crim. Just.

In addition to the above courses a student may elect to take Basic ROTC.

Please see back of catalog for full course descriptions.



Elementary Education

With a concentration in one of the following:

Humanities
Social Science
Mathematics-Science
Reading-Language
Special Education

Secondary Education

With a major in one of the following:

Earth Sciences
English
Social Studies
Mathematics
General Science
Biology
Chemistry
Physics
Modern Languages

Special Program

Speech and Hearing Therapy



Frank E. Marsh, Jr., Dean

The College of Education

Aims and Programs

The general objective of the College of Education is to develop teachers adequate to do America's most important work—guiding the young to maturity.

All programs in Teacher Education are built upon a broad liberal arts base. Professional competence is added to this understanding of our own and past culture. The College believes that an effective elementary teacher requires this broad, liberal experience as a base for professional development.

Secondary education students should be prepared to continue graduate work either in education or in the major subject-matter area.

The course of study in Teacher Education has several distinctive features. A unified professional sequence starts in the first year with social science (Anthropology and Sociology) and continues in the second year with Human Development and Learning. In the third year this program includes the Analysis of Teaching; in the fourth year, Methods and Materials (in specific subject fields), and Measurement and Evaluation; and in the fifth year, Backgrounds of American Education (history and philosophy).

Secondary School Preparation

If you are preparing for secondary school teaching, you must meet the same requirements in your major field as a student in a liberal arts program (30 semester hours above the freshman year). You have a choice of English, Social Studies, Mathematics, Biology, Chemistry, Physics, General Science, Earth Sciences, or Modern Languages. If you wish to major in

Modern Languages, you must continue in college with one language studied previously and add a second one. (See page 43.)

A special program in Speech and Hearing Therapy also is available.

Elementary School Preparation

If you are enrolled in Elementary Education, you must complete 40 quarter hours in one of the following areas:

- A. Science and Mathematics (biology, chemistry, geology, mathematics, natural science, physics).
- B. Humanities (art, drama, literature, languages, excluding freshman English and elementary modern language, music, philosophy, speech).
- C. Social Sciences (economics, history, political science, psychology, sociology-anthropology).
- D. Language-Reading (modern language, linguistics, semantics, speech and hearing, reading, literature).
- E. Special Education (mental retardation, emotional disturbance, psychology of personality, abnormal psychology, sociology, industrial arts and crafts, rehabilitation).

In addition to the sequence of professional education courses listed above, preparation is given in the content and methodology of arithmetic, reading, language arts, social studies, arts and crafts, music, science, and physical education.

The Teacher Aide Program

Opportunities are steadily increasing for selected students to participate as employees of cooperating school departments. If your record justifies your selection, you will assist in administrative as well as instructional functions. Thus you will enjoy a unique opportunity to develop broad viewpoints and gain rich experience which will greatly enhance your confidence and effectiveness as a teacher.

Degrees

The College of Education will award the degree of Bachelor of Science in Education to those who successfully complete the program of preparation for teaching at elementary or secondary school levels.

Your Freshman Year in the College of Education

There are several programs of study in the freshman year, depending upon your field of interest. Common to all programs are English and social science. Specific courses for each major are shown on the following pages.

Sample Freshman-Year Program of Studies in the Teaching of Nonscience Fields

ELEMENTARY EDUCATION/SPEECH AND HEARING THERAPY/ ENGLISH/SOCIAL STUDIES/MODERN LANGUAGES

Mathematics or a modern language may be substituted for Political Science upon approval of the dean during orientation week.

<i>First Quarter</i>	<i>Second Quarter</i>	<i>Third Quarter</i>
16.104 Earth Science	16.105 Earth Science	23.102 Western Civ.
22.101 Political Science*	22.102 Political Science*	30.114 English
30.113 English	23.101 Western Civ.	50.113 Social Science
50.111 Social Science	50.112 Social Science	Elective

*Students may substitute Basic Mathematics or a modern language for Political Science.

In addition to the above courses a student may elect to take Basic ROTC.

Please see back of catalog for full course descriptions.

ELEMENTARY EDUCATION

Your Program of Study

Each student must complete a concentration in one of the following subject-matter areas: social science, the humanities, science and mathematics, language-reading, or special education. The social science field includes anthropology-sociology, history, political science, economics. The humanities include literature, art, music, philosophy, and foreign languages. Special education includes studies in those areas of psychology and sociology most concerned with mental retardation, emotional disturbance, and rehabilitation.

Other courses provide the necessary professional equipment of the teacher. They include Human Development and Learning, Analysis of Teaching, Methods and Materials in Elementary Science, Arithmetic, Reading, Language Arts, Arts and Crafts, Music, Social Studies, Physical Education, Evaluation and Measurement, and Backgrounds of American Education.

The program culminates in a quarter of supervised student teaching in the senior year. Elementary Education students are assigned to a grade in a public elementary school and work under the supervision of the regular classroom teacher and a Northeastern faculty member. They will be actually teaching a good share of the time and observing and assisting the critic teacher the rest of the time.

Your Future

Many persons are content to make a career of classroom teaching in the elementary school and find this a completely rewarding vocation.

Others are interested in qualifying eventually for administrative positions, supervisory positions, or careers in the special education of exceptional children. Such persons will want to go into graduate work to prepare themselves for these positions. A very common practice is for in-service teachers to work part time toward the master's degree while continuing their regular employment as classroom teachers.

With the added experience gained from Northeastern's unique Teacher Aide Program and the opportunity to not only learn the mechanics of your profession but to also make invaluable contacts with various school systems, you should be in an enviable position to find the type of teaching opportunity for which you are best qualified and trained.

SECONDARY EDUCATION

Description

As a Secondary Education major (English, Social Studies, Earth Sciences, Biology, Chemistry, Physics, General Science, Mathematics, Modern Languages), you will teach several classes daily in your main field or in one or two related subjects.

Type of Work

In addition to giving 20 or 30 hours of classroom work per week, you will have many other duties—which always are part of a teacher's job—from correcting papers and planning programs to interviewing parents or directing extracurricular activities.

Your Program of Study

The sequence of professional education courses is essentially the same for both elementary and secondary teachers. Turn to pages 43 and 46 for your program of study. The program culminates in a quarter of supervised student teaching in the senior year. Under the supervision of a regular classroom teacher and a Northeastern faculty member, you will teach three or more classes a day in a public senior or junior high school.

Your Future

Most persons who have mastered a secondary school subject look forward to teaching in the classroom for many years. Some, however, desire to move eventually into administrative or supervisory positions, or into the field of guidance. Such persons will want to go into graduate work to prepare themselves for these positions. A very common practice is for in-service teachers to work part time toward the master's degree while continuing their regular employment as classroom teachers.

SPEECH AND HEARING THERAPY

Description

The profession of speech pathology and audiology (speech and hearing therapy) is concerned with problems and disorders of human communication as manifested in the processes of speech and hearing. It is devoted to providing clinical services to children and adults, as well as to related basic and applied research. Some personnel concern themselves primarily with speech disorders or with hearing disorders; nevertheless, speech and hearing are so interrelated that professional competency requires familiarity with both.

Such terms as speech correctionist and speech and hearing therapist have been used to identify professional persons; however, the American Speech and Hearing Association (ASHA), the national scientific and professional organization devoted to encouraging basic study of the processes of speech and hearing, recommends the use of speech pathologist (or speech clinician) and audiologist.

Type of Work

Duties vary constantly with the individual and the setting. Most individuals will be engaged in two or more of the following types of activity: *Clinical*: evaluation of the speech and/or hearing impairment by a wide variety of diagnostic procedures, followed, when indicated, by a therapeutic program. These activities involve cooperative endeavor with many specialists—physicians, educators, psychologists, social workers, rehabilitation workers, etc. *Research*: those pursuits which seek to increase basic understanding of the complex processes of speech and hearing. *Teaching*: primary concern of members of college and university faculties. *Administration*: constitutes some responsibility of most individuals in this profession.

These duties are carried on in clinical service centers, hospitals, public school systems, health departments, colleges and universities, industry, research centers, and private practice.

Your Program of Study

In your upper-class years, you will have such subjects as: Science of Voice and Speech, Introduction to Speech Pathology, Introduction to Audiology, Psychology, Phonetics, Clinical Practice, Dynamics of Language Development, Psychological Speech Disorders, Speech Reading and Auditory Training, and Organic Voice and Speech Disorders.

Your freshman-year program of studies as a major in Speech and Hearing Therapy will be found on page 43.

Your Future

There is a great demand for speech pathologists and audiologists in the

United States. The employment outlook is especially favorable for speech clinicians in public schools.

Sample Freshman-Year Program of Studies in the Teaching of General Science, Earth Sciences, or Biology

SECONDARY LEVEL

<i>First Quarter</i>	<i>Second Quarter</i>	<i>Third Quarter</i>
10.101 Basic Math. or Calculus	10.102 Basic Math.	10.103 Basic Math.
12.106 Gen. Chem.	18.132 Basic Animal Biology	12.107 General Chem.
18.131 Basic Animal Biology	30.113 English	30.114 English
50.111 Social Science	50.112 Social Science	50.113 Social Science

In addition to the above courses a student may elect to take Basic ROTC.
Please see back of catalog for full course descriptions.

Sample Freshman-Year Program of Studies in the Teaching of Mathematics or Physics

SECONDARY LEVEL

<i>First Quarter</i>	<i>Second Quarter</i>	<i>Third Quarter</i>
10.181 Calculus	10.182 Calculus	10.183 Algebra
11.117 Physics	11.118 Physics	11.119 Physics
30.113 English	23.102 Western Civ.	30.114 English
50.111 Social Science	50.112 Social Science	50.113 Social Science

In addition to the above courses a student may elect to take Basic ROTC.
Please see back of catalog for full course descriptions.

Sample Freshman-Year Program of Studies in the Teaching of Chemistry

SECONDARY LEVEL

<i>First Quarter</i>	<i>Second Quarter</i>	<i>Third Quarter</i>
10.150 Calculus	10.151 Calculus	10.152 Linear Algebra
12.103 General Chem.	12.104 General Chem.	12.105 Analytical Chem.
18.131 Biology	18.132 Biology	30.114 English
30.113 English	50.112 Social Science	50.113 Social Science

In addition to the above courses a student may elect to take Basic ROTC.
Please see back of catalog for full course descriptions.



*Chemical Engineering
Civil Engineering
Electrical Engineering
Industrial Engineering
Mechanical Engineering
General Engineering*



Melvin Mark, Dean

The College of Engineering

The College of Engineering prepares students to participate constructively in a technologically changing world, contributing to the accumulation and application of new knowledge as professional engineers. Fundamentals are emphasized to provide the future engineer with the basic technical knowledge that will enable him to practice in a variety of positions. At the same time study of the social sciences and humanities provides an opportunity to develop an awareness of the social, economic, political, aesthetic, and philosophical influences that are part of the context in which he will practice his profession.

Aims

The concept of education as a continuing, lifelong process necessary for effective work in an environment of constantly new facts, ideas, and scientific principles underlies the complete structure of the engineering curriculum.

Engineering education is directed toward assisting you to:

1. Understand the scientific principles and knowledge of that particular branch of engineering you may choose.
2. Comprehend and develop competence in the engineering method and its application.
3. Communicate effectively and succinctly the important results of any technical study both verbally and graphically.
4. Acquire the motivation for continuing professional growth.

Women in Engineering

More women are entering the field of engineering each year, recognizing the opportunities present. Aware of their qualifications and potential, industry and government provide positions of responsibility for competent woman engineers. Any woman with scientific or technical interests should consider the many possibilities offered in engineering.

Degrees Granted

The College operates on the Cooperative Plan and offers five-year programs of study leading to Bachelor of Science degrees in Chemical, Civil, Electrical, Industrial, and Mechanical Engineering.

Your Freshman Year in the College of Engineering

The freshman year in Engineering consists of the prescribed courses shown in the program below. Study during the first year will build your understanding of mathematics and the physical sciences, and improve your ability to communicate ideas both by verbal and graphic means. Since the first year of study is identical for all Engineering students, you may change your choice of engineering specialization at the end of your freshman year without loss.

Your freshman courses act as a foundation for your upper-class studies which will develop your basic understanding of concepts in the engineering sciences and introduce you to the engineering method and its application. About four fifths of your upper-class program is devoted to scientific and technological study, and about one fifth to humanistic-social courses, with the aim of balancing your growing technical proficiency with a similar development of your appreciation of the nontechnical aspects of society and culture.

Cooperative work in the branch of engineering which you choose will begin upon completion of your freshman year and continue throughout your remaining upper-class years. Your work assignments during this time will prove to be most valuable in helping you to integrate the important elements of both an engineering and a liberal education. They will be instrumental in teaching you the value of teamwork while, at the same time, helping you acquire insight into the problems of actual engineering practice.

Your Freshman-Year Program of Studies in the College of Engineering†

<i>First Quarter</i>	<i>Second Quarter</i>	<i>Third Quarter</i>
10.150 Calculus	10.151 Calculus	10.152 Calculus
11.203 Physics	11.204 Physics	11.205 Physics
* 9.106 Basic Eng.	** 9.107 Basic Eng.	**12.115 General Chem.
*30.114 Intro. to Lit.	*12.114 General Chem.	**30.115 Great Themes in Lit.

In addition to the above courses a student may elect to take Basic ROTC.

†For information and specimen program in General Engineering, see pages 61 and 62.

*First half of a two-quarter sequence. **Second half of a two-quarter sequence.

With respect to the courses in Basic Engineering, Chemistry, and Literature, as indicated by * and **, only two of these three are taken in any given quarter. The order in which these courses are taken will vary according to the section in which students are enrolled. At no time are first-year students required to carry more than four freshman courses.

Please see back of catalog for full course descriptions.

CHEMICAL ENGINEERING

Description

Chemical engineering has grown out of the discoveries in the chemical laboratories, which have served as a foundation for a great many new industries whose production processes involve chemical as well as physical changes.

Petroleum refining, plastics, manufacture of synthetic fibers, and hundreds of other industries require men and women trained in chemistry as well as in engineering. Moreover, much of the training received by the chemical engineer is now being applied to the rapidly developing fields of nuclear engineering, space engineering, and environmental controls. Many older industries, such as foods, textiles, paints and varnishes, and leather are also employing chemical engineers.

Type of Work

The chemical engineer has been defined as a “professional man experienced in the design, construction, and operation of plants in which materials undergo chemical and physical change.” It is the task of the chemical engineer to reduce the costs, increase production, and improve the quality of the products in the industry.

Your Program of Study

After you have taken the fundamental courses in chemistry, mathematics, and physics required of all Engineering students, you will go on to advanced courses which apply these fundamentals to the solution of engineering problems. These upper-class courses are a skillful blend of the latest mathematical and theoretical analysis with the practical aspects of the profession.

Your instructors in the Department of Chemical Engineering have obtained advanced degrees in this field and are directing research programs aimed at solving tomorrow's problems in the area of chemical engineering.

Advanced degree programs, M.S., Ph.D., and D.Eng., available in the Department enhance the undergraduate training.

Since the field of chemical engineering is so varied, your program of study has been designed to provide you with a broad training in which

fundamental principles are stressed. This training will enable you to acclimate yourself readily to graduate school or to whatever industry you may choose.

Your Future

Chemical engineering is one of the fastest-growing major fields of engineering.

The reason is tremendous growth of research and development, especially in such fields as petroleum and chemicals (about one third of all chemical engineers are employed in these fields).

Demand for good chemical engineers is expected to continue in the foreseeable future. Biggest demand is being made by chemical and petroleum industries.

Other opportunities exist in government agencies, consulting firms, and in college teaching.

Chemical Engineering Laboratories

The chemical engineering laboratories are designed to acquaint the student with the experimental approach to the solution of engineering problems and to develop research interests.

Experimental Methods Laboratories—The student is first taught the basic measurements in engineering with emphasis on temperatures, pressure, and flow rate. Following this, he is given problems in such areas as transport properties, kinetics, thermodynamics, and process dynamics, which he must solve experimentally. He is required to design the experiment, conduct it, reduce the data using computers, and to write a final report. In the experiments he uses pilot scale chemical engineering equipment when applicable.

Research Laboratories—Used by advanced undergraduates and graduate students to carry out research in the various areas of chemical engineering. Analytical laboratories and shop facilities are available to support these research projects.

The Nuclear Engineering Laboratory—This laboratory contains a subcritical-reactor purchased in part from funds supplied by the U. S. Atomic Energy Commission. The assembly is fueled with natural uranium and is water-moderated.

The installation also includes a reactor simulator which has the same type of instrument panel and gives the same responses and reactions as any critical reactor in the country.

CIVIL ENGINEERING

Description

"Civil engineers influence the quality of life by shaping the environment and by effecting the ecology."¹

¹From Statement of Policy on Environmental Systems by the American Society of Civil Engineers.

Civil engineering deals with the conceiving, planning, designing, constructing, and operating of environmental systems in the air, on water, and on land. Each project or system is unique, designed to fit the particular requirements of a single location and purpose. These projects or systems help shape man's environment by making beneficial use of his natural resources. Competent design solutions represent the most economical solutions, with due regard to a structure's effect on the environment and its satisfactory performance during its design life.

In general, civil engineering work includes housing, transportation, and communications; and more specifically, highways, airports, spaceports, pipelines, rail lines, bridges, dams, irrigation works, water treatment plants and distribution systems, wastewater treatment and recovery plants, air pollution treatment, solid waste disposal operations, and the design of buildings of all sizes for all purposes.

Traditionally, civil engineers have been leaders of an interdisciplinary approach to the improvement and protection of environmental quality. They will continue to work toward this betterment as they improve and develop the science and technology necessary to provide broad and fundamental benefits for an improving quality of life and a social consciousness to match their technical know-how.

Type of Work

Civil engineering is as old as civilization itself and, until recent times, it embraced all phases of engineering except those of a military character. Today its major branches include topographical, municipal, railroad, highway, structural, hydraulic, and environmental engineering.

Civil engineers work with facts rather than fancies, but also work on problems for which the answers are not known and for which there are likely to be several possible solutions. They must have imagination and be inventive and not be afraid of the unknown or untried.

Civil engineers work to improve man's environment; they help produce industrial plants, great public works, housing, bases for space exploration and travel, and transportation networks. The work areas range from the cities to the wilderness, in developed and developing countries, and from the equator to the polar regions.

Your Program of Study

Since the first step in every civil engineering project involves accurate measurement of the surface features of the land, of the nature of the soil, and of the character of the underlying rock, the study of Surveying and related subjects, such as Geology and Soil Mechanics, will be included in your program of study.

You will also study in detail such subjects as the Mechanics of Static Bodies, Strength of Materials, and Theory of Structures, since the primary consideration in designing any structure is to make certain that it will safely withstand any force to which it may be subjected.

Your program of study is thus intended to prepare you for graduate school or to take up the work of design and construction of structures, and to solve the problems of water supply and waste water disposal, along with other problems of pollution of our environment. You will also learn to undertake intelligently the supervision of work in allied fields of engineering and in general contracting.

Your Future

Your work as a civil engineer will be relevant to man's present culture and future needs.

Largest employment field: Federal, state, and local government agencies.

Second largest group: construction and consulting engineering offices.

Other major employers: public utilities, railroads, banks, finance, insurance and real estate firms, colleges and universities.

Civil Engineering Laboratories

The Cement and Concrete Testing Laboratories, among the finest in the United States, are equipped to conduct the standard physical tests in cement and concrete as specified by the American Society for Testing Materials. Additional equipment is available for research work. The research facilities are used in conjunction with others throughout the United States and Canada for work of the A.S.T.M. technical committees.

The Hydraulics Laboratory is designed as a teaching aid and is used in conjunction with hydraulics courses.

The Environmental Engineering Laboratories are used by both undergraduate and graduate students. The laboratories are fully equipped to perform any analysis on the examination of water, waste water, and industrial wastes. Research in many areas is also conducted.

The Air Sampling and Analysis Laboratory contains sophisticated equipment for sampling and conducting physical and chemical analysis of pollutants in the atmosphere.

The Soil Testing Laboratory is equipped to conduct the usual tests required to evaluate soil as a construction material and is also equipped and used for research.

Surveying Equipment is complete and is capable of coping with the most complex surveying projects encountered in engineering, including the electronic method (geodimeter) of measuring linear distances.

ELECTRICAL ENGINEERING

Description

Electrical engineering today embraces a continually widening sphere of activity. It ranges in scope from laboratory and theoretical studies in applied physics to the economic design of communications and energy systems, serving not only the land-based requirements of entire continents but also the needs of space exploration.

Because electrical properties, concepts, instrumentation, and control are basic to much of modern technology, the electrical engineer is often engaged in interdisciplinary activities. Examples are biomedical electronics, electro-optics, and machine translation of languages.

Type of Work

Research and development, feasibility studies, design, supervision of manufacturing or installation, and operation—all involving electrical devices, components, or systems of components—make up the typical work of the electrical engineer.

Your Program of Study

Since electrical engineering obtains much of its impetus from pioneering developments in the pure sciences, your program of study will start with fundamental courses in mathematics, physics, and chemistry. In the Department of Electrical Engineering, your courses will be divided into five related sequences: circuits and systems, including feedback control; electronics and communications, including an introduction to solid-state physics; electromagnetic field theory and microwave devices; energy conversion, emphasizing electromagnetic devices; and laboratory work associated with all of the foregoing.

In the senior year, engineering electives are offered in order that you may have the experience of depth and specialization.

Power Systems Engineering

A program in Power Systems Engineering is conducted in cooperation with electric power companies in New England and other eastern states. The master's degree can be obtained in six years of cooperative education. Students should write to Philip R. McCabe, Director of Admissions, for further information.

Your Future

Employment opportunities are found both in large industrial companies and small business firms. Satisfying jobs exist in the great university, industrial, and government laboratories.

Advanced degrees and continuing education courses beyond the baccalaureate degree will be of increasing importance to those who wish to practice electrical engineering as a profession. For others whose inclinations are directed toward science and technology but who do not intend to practice electrical engineering professionally, an undergraduate education in this field is an excellent preparation for a variety of careers. Some electrical engineering graduates enter graduate programs in the biomedical field, computer sciences, and other related areas. Still others enter industry and graduate toward management positions in technically oriented companies.

Electrical Engineering Laboratories

The Northeastern electrical engineering laboratories are patterned after a composite of typical industrial research and development laboratories. Boasting a wide variety of modern testing and measuring equipment, the laboratories are an excellent adjunct to the classroom. Here the student may simulate or fabricate devices or systems which have been studied in his lecture courses.

From light machinery and power equipment to microwave precision systems, students plan and pursue their projects in the laboratory. The recent acquisition of a digitally programmed analog computer also permits the study of larger or more complex systems than can be realized in the laboratory itself.

The laboratory programs are organized to provide an atmosphere of freedom, and students can exert considerable influence on their own study efforts.

The laboratory program consists of six courses. The first is devoted to contemporary measurement techniques involving wide-band oscilloscopes, various test generators, elementary potentiometric systems, and studies of nonlinear devices. The second course is designed to demonstrate the significance of device parameters, which must be experimentally determined to characterize devices completely for incorporation into systems. The third course shows methods of testing to establish significant comparisons of experimental models with analytical models.

The remaining courses depend largely on the individual student. More than one third of the laboratory program is devoted to laboratory projects in which students devise and carry out experimental studies under the guidance of faculty members and laboratory instructors.

Spacious and well-lighted, the laboratories are operated from early morning to late evening, giving students the utmost freedom in pursuing their experimental interests in electrical engineering.

INDUSTRIAL ENGINEERING

Description

Industrial engineering, one of the most rapidly expanding fields of engineering, is concerned with the design, control, and operation of productive systems along with manufacturing and service organizations.

The recognition that many management problems can be formulated and solved with the aid of mathematical or scientific methods has created a demand for men and women with training in engineering and science to assume administrative responsibility in industry. Today industrial engineers are found not only in manufacturing, but also in government service, hospitals, banks, transportation, law, medicine, research, and many other areas requiring broad engineering and managerial skills.

Should I Study Industrial Engineering?

Do you like to work with things: e.g., machines and automobiles? Do you like to experiment and make changes? Do you like to get results through working with people? Do you like (can you tolerate) mathematics and science? Do you like to plan projects before doing them? Do you like to save money? If you answer “yes” to many of these questions, you should consider Industrial Engineering as a concentration.

What Is Industrial Engineering?

Everyone knows what a kitchen is and what activities take place there. Let us draw the following comparisons between what the industrial engineer does and activities in the kitchen.

<i>Kitchen Activities</i>	<i>Industrial Engineering Activities</i>
1. Timing preparation of a meal so that all items are cooked and ready at mealtime	1. Production scheduling
2. Location of stove, sink, refrigerator, etc. in the kitchen	2. Facilities planning and plant layout
3. Moving hot and cold foods from kitchen to dining room and returning dirty dishes	3. Materials handling of production items
4. Arranging ingredients and cooking utensils for the preparation of a pie	4. Arranging a work place with proper tools and materials to perform an assembly easily—work design
5. Persuading the children to wash the dishes	5. Personnel relations
6. Checking the quality of job the children do at dish washing	6. Quality control of production items
7. Determining the quantity of can goods to stock in the pantry	7. Inventory control of goods

Your Program of Study

The extensive sequence in physics, mathematics, and engineering sciences in your program sharply differentiates your education from that of the student of business management.

Your first two years will be devoted primarily to building a strong foundation through the study of mathematics, physics, English, chemistry, and the engineering sciences.

In your junior and senior years more advanced subjects will be included. Among these are statistics, probability, operations research, quality control, computer science, management information systems, and plant layout.

Your Future

Occupational outlook: excellent

Factors in your favor as an industrial engineer will be:

1. Expansion of automation.
2. Increasing complexity of industrial operations.
3. Vital role of the industrial engineer in reducing costs and increasing productivity.
4. Increasing acceptability in nonmanufacturing business: e.g., hospitals, newspapers, airlines, and other service industries.

Integrated Industrial Engineering Laboratories

The facility provides resources for students to work on projects in the area of plant arrangement and tool location, and studies of production equipment. Students work as individuals or in groups at the projects, depending on the scope and complexity of the problem. Extensive laboratory project work is also conducted in outside industrial plants and service organizations on actual problems, combined with occasional plant visits to view actual operations.

The Computer

Students are required to learn basic computer programming in their first year. In later years they are asked to solve complex problems by computer. The University Computation Center provides a service to the student where he can leave his program at the Computation Center. An experienced computer expert will then run the program on a high-speed digital computer and, in a short time, the student can pick up his results. The computer is of particular interest to the industrial engineer, since many complex problems such as assembly line balancing, mathematical modeling, and industrial simulations require a computer solution.

For further information about the Industrial Engineering curriculum, communicate with the Chairman, Department of Industrial Engineering, in 590 United Realty Building, or call (617) 437-2740.

MECHANICAL ENGINEERING

Description

Mechanical engineering has been traditionally defined as that branch of engineering which is concerned with design, development, and manufacture of machines which do work or produce power. Included are such well-known machines as the internal combustion engine, heating and air conditioning systems, machine tools, printing presses, and rolling mills. What is not generally appreciated is the role which the mechanical engineer plays in developing new machines which operate in unique ways under special conditions. For example, the space program requires engines which operate in the vacuum of outer space; power supplies for satellites

which operate reliably for long periods of time on a single charge of fuel; and materials to survive the severe conditions of reentry into the atmosphere. Deep-sea exploration requires vehicles which can operate under enormous pressure loads. Production of electrical power requires efficient operation under conditions which maintain a clean environment and conserve limited fuel resources. The mechanical engineer is participating actively in all these areas and many others.

Your Program of Study

The curriculum is designed to accommodate the broadening demands on the mechanical engineer by first establishing a firm foundation in the basic sciences and then permitting the student the option of directing his studies toward a chosen area of interest.

In the first three years the student in Mechanical Engineering studies the basic sciences (mathematics, physics, and chemistry), the engineering sciences (mechanics, thermodynamics, fluid mechanics, and materials science), and the humanities. As an upperclassman he can elect to concentrate his studies in the areas of thermofluid engineering, mechanics and design, or materials science and engineering.

Thermofluid engineering is concerned with the properties and characteristics of the working fluid of machines. For example, the ability of an aircraft to fly depends upon the manner in which air flows over its lifting surfaces. The engineer must understand the characteristics of fluid flow. The energy to run a turbine is extracted from the steam or combustion gases which pass through it and the engineer must have a knowledge of the concepts of thermodynamics; the efficiency of a cooling tower depends upon the mechanisms by which fluids transfer heat to surfaces and the engineer must have a firm grasp of the principles of heat transfer.

Mechanics and design are based upon the fundamental scientific and mathematical tools which are utilized in the analysis of mechanical configurations as they evolve in the design of machines and power-producing devices. For example, the engineer in the area of mechanics and design will analyze and design plate and shell components for nuclear power plants and deep-sea oceanographic vessels; he will develop new methods for evaluating filamentary composite structures; in the modern machine tool industry he will be concerned with computer control of machine tools; in the engine industry he will analyze stresses in such components as turbine blades. To prepare for this the upper-class student will elect such courses as experimental stress analysis, advanced strength of materials and deformation of solids, vibrations, numerical and computer methods in engineering analysis.

Materials science and engineering are concerned with understanding the relationships between the structure and properties of materials and with control of the structure to achieve desired properties. Only recently have engineers come to realize that an understanding of the principles of materials science enables them to design more creatively and with greater freedom than the traditional reference to handbooks. Examples of areas

where mechanical engineers find materials properties a part of the basic design function are: manufacturing techniques, structures (vehicles, buildings), energy conversion, electronic devices (including computers), packaging, and prosthetic devices. For those mechanical engineers who desire further knowledge in the materials field, advanced courses are available.

Your Future

It is to the credit of the mechanical engineer that he has accepted the challenge of new technologies and has expanded his areas of competence to meet this challenge. Today he is found contributing in an important way to many industries which have not been considered the traditional domain of the mechanical engineer. Because of this, the opportunities for the mechanical engineering graduate have been considerably broadened.

The mechanical engineer has played a major role in the development of new technologies such as space, direct energy conversion, nuclear power, and materials science. He can be expected to make important contributions to current problems of environment, pollution, transportation, and ecology.

Mechanical Engineering Laboratories

The concept of instruction in the mechanical engineering laboratory has departed from the traditional program of a series of separate designated experiments to one in which the laboratory is used primarily as a vehicle for investigating a problem of interest to the student. This permits the student to examine the problem in greater depth and serves as an introduction to the manner in which an engineer will function in industry.

The student has free access to the facilities of the various mechanical engineering laboratories, which include:

Materials and Metallurgy Laboratories—These laboratories are well equipped to treat the physical examination of materials and their structures. The equipment includes modern apparatus for vacuum melting technology, X-ray diffraction, and thermal expansion studies, two research metallographs, an electron microscope, and a fluid-to-fluid extrusion press.

Fluid and Gas Dynamics Laboratory—Designed to study aerodynamic and hydrodynamic phenomena such as vortices, separation streamlines, and shock waves. Equipment includes an aerodialog, an axial flow fan, shock tube, subsonic wind tunnel, and a supersonic wind tunnel.

Materials Testing and Stress Analysis Laboratories—Equipped to handle both the destructive and nondestructive testing of materials, this laboratory has a 300,000-lb. Universal testing machine provided with an automatic electronic stress-strain recorder and a high-temperature tensile test furnace.

Stresses and strains may be determined experimentally by the use of strain gage, photoelastic, photostress, and brittle lacquer techniques.

Recent additions include a fatigue testing machine of 2,000-lb. capacity, and vibration testing units.

Heat Engineering Laboratories—These laboratories include:

1. A refrigeration unit which may also operate as a heat pump.
2. Two solid injection diesel engines provided with a continuous oxygen analyzer, one equipped with a strain gage torque meter.
3. A CFR fuels research engine equipped with a strain gage pressure transducer.
4. A 60-h.p. Rover gas turbine with automatic controls and Froude dynamometer.
5. Apparatus for study of steam-to-water heat transfer, comparison of film versus dropwise condensation, heat transfer to a boiling liquid, and thermocouple recovery factor.
6. A thermoelectric generator to study the direct conversion of heat into electrical energy.
7. A thermoelectric refrigeration test facility for development of single and multi-stage thermoelectric coolers.
8. A Curtis steam turbine and condenser.

Automatic Control Laboratory—This new area includes:

1. A feedback control system.
2. Analog computers for simulation of engineering problems, fluid power testing units.

GENERAL ENGINEERING

Description

Engineering and technology influence all areas of endeavor and have a profound effect on the lifestyle and institutions of the society. The impact is both cultural and scientific and is manifested by the awareness that solutions to society's problems are, in part, technological. The major purpose of the General Engineering Program is to provide flexible, interdisciplinary educational opportunities based on fundamental engineering concepts. Its interdisciplinary nature allows the student to develop other areas of interest in which an engineering background is professionally useful.

Type of Work

The program is designed for students whose interests are in engineering-related professions rather than in the traditional profession of engineering. It is expected that the work engaged in by graduates of this program will encompass the entire spectrum of professional activity. Typical areas include urban planning, technology of health-care and public administration, and legal aspects of technology. In addition, opportunity exists in the emerging, highly interdisciplinary fields, such as ocean engineering, bio-engineering, and systems science.

Your Program of Study

The General Engineering Program is highly elective and gives the student the opportunity to develop, in conjunction with his adviser, a program de-

signed to meet his own career objectives. To achieve this goal, the student is exposed to the fundamental engineering areas of electric circuits, systems, mechanics, thermodynamics, and materials. These courses are based on basic principles developed in early courses in the mathematics and physics.

Since the computer is a basic tool in any technological environment, each student is required to learn the elements of computer programming.

Specimen Freshman Year

<i>Quarter 1</i>	<i>Quarter 2</i>	<i>Quarter 3</i>
10.150 Calculus	10.151 Calculus	10.153 Calculus
11.203 Physics	11.204 Physics	11.205 Physics
9.106 Basic Eng.	9.106 Basic Eng.	30.115 Grt. Them. in Lit.
30.114 Intro. Lit.	*Liberal Arts Elective	*Liberal Arts Elective

**Chemistry or Biology may be substituted for the Liberal Arts Elective provided that the latter is taken in place of an upper-class elective. In addition to the above courses, the student may elect Basic ROTC.*

Your Future

All of society's forecasting indicators point to a bright future. It is difficult to imagine how society will grow and solve its problems without relying on personal knowledge in engineering. A wide variety of employment opportunities exists in both the private and public sectors of the economy.

Graduate education and continuing education are becoming increasingly important in professional life. By appropriately planning his program, the student will be able to satisfy the prerequisites necessary for admission into all types of graduate and professional schools.

BIOPHYSICS AND BIOMEDICAL ENGINEERING

An education, which includes a strong background in physical and engineering science together with studies in biological sciences and humanities, prepares the undergraduate for several careers. These include medicine, dentistry, biophysics, and biomedical engineering.

There is no special curriculum in Biomedical Engineering. Several of the engineering disciplines provide the student with a strong background in physical science and engineering, together with education in the humanities. The purpose of the Department of Biophysics and Biomedical Engineering is to help the student choose courses in the biological sciences and to integrate his program in order for him to achieve the above career objectives.

Students who are interested in the above careers should take biological sciences in their freshman year. The freshman program in Engineering permits one to do so, since Biology can be substituted for a portion of Basic Engineering in the freshman year. Students who wish to take an integrated program directed toward one of the above areas must contact the Depart-

ment on their arrival as freshmen. This will permit arranging for the above substitution and for further planning of the student's career.

The Department also provides guidance for students, other than freshmen, who are interested in the above careers.



**Bachelor of Arts
or Bachelor of Science**

Art History
Biology
Chemistry
Drama
Economics
English
Geology
History
*Independent Major**
Journalism
Mathematics
Modern Languages
Philosophy
Physics
Political Science
Psychology
Sociology and Anthropology

**Bachelor of Arts only.*



Robert A. Shepard, Dean

The College of Liberal Arts

Today it is widely accepted that a liberal education, which guides young men and women toward intellectual maturity, must prepare them for both the art of living and for the earning of a living. The College of Liberal Arts holds that a truly liberal education and preparation for a career go hand in hand.

As a liberal arts student at Northeastern, your academic study may be complemented by experiences on the Cooperative Plan, which will enable you to develop such desirable traits as self-reliance, initiative, and the ability to work harmoniously with others.

You may also choose to attend Northeastern on a four-year non-Cooperative Plan instead of on the Cooperative Plan.

Aims

As a student in the College of Liberal Arts you will learn to appreciate the basic values upon which civilization and culture rest, and perceive and accept your responsibilities as an active participant in social groups—the family, the community, the nation, and the world. At the same time you will be aided in the development of a resourceful and independent mind; the ability to use, as well as to accumulate, knowledge; and the awareness of your mental strengths and weaknesses.

Degrees Granted

Students in the College of Liberal Arts may earn either the Bachelor of Arts or the Bachelor of Science degree. The Bachelor of Arts degree requires proficiency in a foreign language and supplementation of study in your major area with a range of courses in the humanities, social sciences, and sciences. The Bachelor of Science degree provides an opportunity for greater concentration in courses in the major. This concentration is possible because there is no language requirement (except in the Biology and Chemistry programs) and because there are comparatively few requirements in fields outside the major.

Preprofessional Preparation

In the College of Liberal Arts you will be able to get the necessary preparation for professional education in dentistry, law, library science, medicine, social work, and theology.

Since admission requirements of these programs vary, upper-class advisers counsel students on their choice of courses.

Combined Degree Programs

Under Northeastern's combined program with professional schools, students may reduce by one year the time ordinarily required to obtain the Bachelor of Arts and the professional degree. After completing three fourths of the requirement for the Bachelor of Arts degree and being admitted to a professional school of dentistry or medicine, students may qualify for that degree at the end of their second year in professional school.

Students preparing for dentistry or medicine normally enroll in the Biological Sciences program. Those preparing for law normally enroll in the Political Science or History curriculum. *However, it is possible to prepare for these careers with other majors. Professional advising is available and should be sought before selecting a major.*

Your Freshman Year in the College of Liberal Arts

As a student in the College of Liberal Arts, your freshman-year program will be determined partly by your probable major, and partly by your choice of courses. It is important that you discuss your particular area of interest with an admissions or guidance counselor. Entrance requirements will vary according to the general area for which you have applied, and the extent of your verbal and mathematical aptitudes will have a direct bearing upon your success as a student.

During much of your first two years you will study a series of basic subjects which are determined by your choice of a program. If you are to obtain a liberal education, you must have preparation in several basic fields.

Thereafter, in your upper-class years, you will have the choice of a wide range of Liberal Arts electives which will enable you to plan a program in

keeping with your particular interests and aptitudes. *Certain courses offered in the other Basic Colleges will be open to you.*

Through a comprehensive guidance program you will be advised in your selection of courses so that you may attain reasonable academic objectives.

Sample Freshman-Year Program of Studies for Liberal Arts Students

All students in the College of Liberal Arts have the opportunity to choose courses from the following list of subjects:

American History	Geology	Psychology
Art	German	Russian
Biology	Italian	Spanish
Economics	Music	Sociology
English	Philosophy	Theatre
French	Political Science	Western Civilization
Geography		

In addition, separate courses, differing in approach, are available in each of the following subjects; one approach is appropriate for science-oriented students, one for social science- and humanities-oriented students.

Chemistry
Mathematics
Physics

Your freshman program will consist of either five or six subjects, depending on your intended major. You will take four subjects each quarter. An example of a six-subject program is shown below.*

<i>First Quarter</i>	<i>Second Quarter</i>	<i>Third Quarter</i>
Political Science	Art	English
Spanish	Spanish	Geology
Art	English	Sociology
Geology	Sociology	Political Science

The above is only one of many possible combinations of courses in the freshman year. You will be asked to select the combination which best matches your interests and your intended major. This selection will be made using forms sent to you in the late spring of the year in which you enter Northeastern.

Honors Program

For qualified students, the College of Liberal Arts offers a more challenging course of study in certain courses in the social sciences and humanities. The program offers the student smaller classes, more individual

* ROTC possible.
Please see back of catalog for full course descriptions.

attention by teachers, and greater opportunities for independent study. The participating student receives special recognition for his honors work and the chance to take part in the more specialized honors work of subsequent years. The University will send invitations to eligible students after their applications have been processed.

ART HISTORY

Description

The Art Department offers courses covering the history of art to the present, with the objective of developing a knowledge of the various forms and styles of expression in the visual arts.

Your Program of Study

If you major in Art History, you will study the evolution of architecture, sculpture, painting, graphic arts, photography and film art, and the most modern trends in European and American art. All courses are presented by illustrated lectures using slide projection or films, and students study original works of art in various museum collections. You will start by being introduced to all the art forms in a course titled History of Art I and II; and then choosing from a variety of courses in the Art Department curriculum, you will continue through the college years to explore in greater depth all western and oriental arts.

Your Future

Many Art History majors eventually teach in secondary schools or junior colleges where there is a considerable demand for people trained in the arts. Some people work in museums or go on to graduate school involving art research, writing, and teaching in universities.

The Full-Time and Cooperative Plan Programs

Art History majors may follow a full-time or cooperative program in the Art Department. Full-time students graduate in four years rather than in the five-year cooperative program. For students on the Cooperative Plan, jobs are available in museums, government, and related artistic positions.

BIOLOGY

Description

The world of living things—from microbes to men—is the concern of the biologist. Biological scientists can be grouped into three broad and general subdivisions on the basis of the variety of organism with which they work: botanists (plants), microbiologists (microorganisms), and zoolo-

gists (animals). There are many subspecialties in each of these three main subdivisions.

Type of Work

By majoring in Biology at Northeastern you may prepare for many different occupations in the biological sciences, and for dentistry, medicine, or teaching.

If you have a degree in biology, you may study to become a bacteriologist or a pathologist, or engage in sanitation work, biological surveying, or biological engineering. It is also the background for nutritionists, who study the processes through which human beings and animals utilize food.

Many graduates with degrees in biology are employed in the fisheries or forestry services, public health, or county agency work. Some undertake specialized study to prepare for work in museums as botanists or zoologists; others became interested in various types of experimental research work. Many Northeastern students have also undertaken graduate work in these areas, often on fellowships or as teaching assistants.

Premedical

Predental and premedical students major in Biology to obtain the necessary courses for admission to dental or medical school. A predental and premedical adviser counsels students in their upper-class years to make certain that the proper courses are elected, since the admission requirements of professional schools vary. Premedical students are cautioned that *the successful completion of the required premedical program by no means ensures admission to a medical school*. Since most medical schools have far more applicants than they can admit, standards of selection are most rigorous. Premedical students who elect to be excused from the Co-operative Plan are able to complete the five-year program in four years.

Predental

Predental students at Northeastern ordinarily need three years to meet dental school admission requirements. Under Northeastern's combined program with professional schools, predental students may reduce by one year the time ordinarily required for obtaining the Bachelor of Arts and the professional degree. After completing three-fourths of the requirement for the Bachelor of Arts degree, they may qualify for that degree at the end of the second year in dental school.

Your Program of Study

In your initial classwork you will be introduced to several branches of the biological sciences. This is to enable you to understand and appreciate how each related field contributes to the overall view.

Your basic course work will include such subjects as Organic Chemistry, Physics, and Mathematics, and many hours of laboratory instruction. Students interested in experimental biological research should seek additional training in chemistry, mathematics, statistics, and physics.

Your Future

The demand for biologists fluctuates with general economic conditions, the supply of graduates, and other factors. Most biologists are employed by local, state, or Federal government agencies or in private and public educational institutions, mainly in teaching and research, which are largely financed, either directly or indirectly, by the public. In the 1970s the amount of money allotted for conservation, environment protection, and public health will influence the demand, inasmuch as biologists are involved in these areas at all levels of training.

Because the supply of graduates of dental and medical schools is controlled by the number of spaces available in these professional schools, and the number of graduates lags behind the demand, the outlook in these fields is excellent. The nation's expanding population and a rising concern for medical and dental care ensure an increased demand for trained personnel which can be expected to continue even if the capacity of professional schools should be significantly increased.

As a result of the increased needs for medical care, there has been a trend toward increasing the number of persons in paramedical professions, most of which require some training in various areas of biology.

Biology Laboratories

The Department of Biology includes major laboratories, aquarium rooms, stockrooms, preparation rooms, research areas, and a large suburban greenhouse.

The laboratories are self-contained units fully equipped for the work to be undertaken in them. Appropriate museum preparations, models, charts, specimens and slides are present in the laboratories, which include general biology, anatomy, bacteriology, microscopic anatomy, and physiology.

Special equipment for field studies on mammals, histochemical investigations, and hematological studies is also available. The Department has a close association with the University's Marine Science Institute at Nahant.

CHEMISTRY

Description

Many of the startling discoveries affecting man's way of life, and a myriad of others which add to his comfort and welfare, are the result of chemical research. Detergents, antibiotics and other wonder drugs, new fabrics made from synthetic fiber, and rocket fuels—these are just a few examples of the wide range of products which research chemists have helped to make possible. To make these discoveries, chemists—through either basic or applied research—have had to understand the composition of substances and the transformation which they undergo.

Type of Work

Graduates of the Chemistry program at Northeastern are employed in a wide variety of technical functions, such as research and development, production, sales, market analysis, purchasing, and teaching. They are able to offer prospective employers the benefits of practical experience in some of these fields as a result of the cooperative work program at Northeastern. Many graduates decide to continue in graduate studies, for which the Chemistry program at Northeastern provides an excellent foundation.

Your Program of Study

The Chemistry program at Northeastern is approved by the American Chemical Society.

In the freshman year the courses taken will generally be Chemistry, English, Calculus, Physics, a foreign language, and an elective. Upper-level courses include Organic, Inorganic, Physical, and Analytical Chemistry, and Advanced Chemical Topics. Qualified students are encouraged to undertake a research project under the supervision of a faculty member. For the especially able student, an honors program is available.

Your Future

Chemists find employment in many industries. Good opportunities exist in the plastics manufacturing industry, the iron and steel industry, rubber and allied products industries, petroleum production and refining operations, and in the pharmaceutical industry.

Best bets are research in industrial, foundation, and government laboratories. Teaching and research assistantships are generally available while students are working toward advanced degrees, so that graduate study is not a financial burden. Research and development is the likeliest spot for those with Ph.D. degrees.

Chemistry Laboratories

Hurtig Hall, the chemistry building, provides modern, air-conditioned laboratories for gaining experience in experimental chemistry. The basic courses include experiments that use up-to-date techniques: i.e., potentiometric and colorimetric analysis, spectroscopy, gas chromatography, calorimetry, and mass spectrometry. In addition, the excellent research equipment of the Department of Chemistry is available to upper-class students who participate in original research conducted by the faculty.

DRAMA

Description

As a student of drama and theater arts, you can cultivate an understanding and appreciation of one of society's main civilizing forces; develop your creative, emotional, and intellectual powers, and your standard of

taste and craftsmanship; master the tools of your future life—professional, educational, or avocational; and gain an insight into human behavior and emotion.

Your Program of Study

If you have chosen to major in Drama, you have probably already been exposed to theater as an art form or as an extracurricular activity. You have no doubt already discovered the excitement of either acting a role or helping in the mounting of a play. As an undergraduate Drama major, you will be required to follow a program of studies which will introduce you to the total theater experience, as well as to each of the individual theater arts and crafts.

You will study theater history and drama criticism, dramatic literature and play-writing, acting, directing, and technical production. You will learn in the classroom and perform in the laboratory—the theater and its shops. You will learn the many interpretative and creative arts and crafts which compositely and collectively make for the art of the theater. You will be able to express your creative and interpretative gifts in your courses, in your laboratory classes, in your working in the casts and on the crews of productions, and in your seeing and testing of the productions of professionals and of students in sister institutions. As a senior, you will be able to demonstrate your artistic abilities in independently organized but faculty-directed projects in play-writing, acting, directing, or design.

Your Future

Theater is not just acting. The activities which make up the theater involve writing, designing, publicizing, criticizing, organizing the business forces, preparing budgets, estimating costs, and creating and executing costumes. Studying in the theater can prepare a student for many jobs exclusive of those waiting for the gifted in professional theater. You can prepare yourself for journalistic play reviewing, public relations and advertising, television and radio production and writing, or interior decoration. Of course, you may go on to graduate work in the theater to gain professional proficiency in one specific area; or you may teach in high schools and colleges, two of the most active theater-producing agencies in the country. Also, you may major in the theater in the liberal arts tradition, to use theater avocationally.

ECONOMICS

Description

Economists study the ways in which men make their living and the factors which determine their success or failure in satisfying their material needs.

Some economists are concerned with such problems as the control of

inflation, the prevention of depression, the elimination of poverty, the regulation of pollution, and the development of farm, wage, tax, and tariff policies. Others develop comprehensive theories to explain the causes of unemployment and employment or the ways in which international trade influences world economic conditions. Still others are concerned with the collection and interpretation of data on a wide variety of economic problems.

Type of Work

A graduate of the program of study in Economics may be employed in a community action program, or in the business world as an industrial economist, in general management, in banking, in industrial relations, or with a labor union; he may be in foreign trade, advertising, in economic research on a subject such as plant location; or he may qualify for entrance into the Civil Service.

A person trained in economics may become expert in analyzing consumer demands, the marketing and developing of new products, or the making of financial studies. He may conduct research, provide specialized services on a consulting basis, or go into teaching. Economists are found in almost every area of human endeavor.

Your Program of Study

You may have several reasons for your interest in majoring in Economics. Perhaps you are planning a specific career or wish to study economics in conjunction with other areas of knowledge in order to obtain a liberal education.

The core courses will provide training in economic theory, money and banking, public finance, labor, international trade, growth and development, and urban problems. In addition, courses are available in the use of such tools as statistics and the computer. A large number of electives are provided which permit you to study more deeply in areas of your own interest.

Your Future

Employment outlook: Demand for well-trained economists will increase throughout the 1970s; those with a bachelor's degree will continue to be in demand as market research assistants and as administrative and management trainees.

About one half of the professional economists are employed by colleges and universities, and a master's degree is usually the minimum requirement. Another third of the economists are employed by government agencies, mostly Federal.

For those starting with research jobs compiling data, a thorough knowledge of statistical procedures will be very helpful.

ENGLISH

Today, perhaps more than ever before in the history of the United States, a high value is placed on the individual who can express himself well in both the written and the spoken word. Clarity, a precise choice of words, accurate description, and brevity in communication are vital to most phases of business and industry.

Type of Work

After graduation English majors secure permanent employment in public relations, advertising, journalism, radio and television, or related fields. Many go on to graduate study in order to qualify for careers in education, library service, religion, or other professions.

Your Program of Study

If you are thinking of becoming an English major in Northeastern's College of Liberal Arts, you have very likely already formed the habit of reading for pleasure and of jotting down, at least occasionally, some ideas that you think worth expressing.

Your goal as an undergraduate will be to become acquainted with the best examples of literature and to develop skill in communication with others. In addition to the freshman course in English composition, you will have a chance to take two courses in creative writing and will decide whether to compose short stories, poems, short plays, magazine articles, or some of each.

In literature you will survey the outstanding English and American works from the earliest days to the present. You may also wish to learn something about the nature and structures of language itself—how words are formed and why we spell them as we do; how words are borrowed from other languages and remodeled to suit our English vocabulary: and how word meanings change.

While much of your study will be concerned with language and literature, you will also study other subjects as a foundation for well-rounded thinking: history, economics, government, science, and, perhaps, sociology.

GEOLOGY

Description

Mountain peaks and ocean deeps, volcanoes and earthquakes, trilobites and dinosaurs, gemstones and precious metals: all materials and features of the earth are investigated by geologists. Many unexplored frontiers await each new geologist, as only small portions of the earth have yet been studied in detail.

Type of Work

Most geologists are people who enjoy the out-of-doors. While laboratory analysis, microscopy, x-ray crystallography, and computer programs may all be used in various aspects of the geologist's work, he first collects his data in the field. The various geological specialties include mineralogy, economic geology, glacial geology, geophysics, geochemistry, paleontology, geological oceanography, and the very new specialty of astrogeology associated with the space program.

Geologists find employment opportunities in the Federal and state agencies, many segments of private industry (but particularly the petroleum and mining industries), and in universities where they engage in both teaching and research.

Your Program of Study

The undergraduate Geology program introduces students to several areas of geological study. An understanding of minerals and rocks is fundamental for every geologist, however. Courses in Mineralogy and Petrology are required of each student following introductory courses in Geology, Mathematics, Chemistry, and Physics. Students will elect at least six additional geology courses during their last three years. While not required, students are strongly urged to include Paleontology, Structural Geology, and Sedimentation-Stratigraphy among their elective courses.

Field work will be a significant portion of each course wherever appropriate. Students will be assigned local areas which they will investigate under the direction of a faculty member. A presentation (both oral and written) of the investigation will be made. Cooperative work assignments will complement the classroom work whenever feasible. The opportunity to work directly with a practicing geologist is a distinct advantage of the Cooperative Plan. A full-time option is also available.

Your Future

Most professional geologists hold advanced degrees, so students in geology should plan now to continue with graduate study. An increasing number of opportunities for geologists is anticipated during the next 10 years as more emphasis is placed on the environment and natural resources. Problems of land use and water resources are only two of the many areas where geological knowledge will be needed in the near future.

The rapid increase in earth science courses in the secondary schools will also provide employment opportunities for many geologists.

HISTORY

Description

History courses at Northeastern seek to describe and explain the varied activities and problems of human beings from ancient times to the present.

Your Program of Study

If you major in History, you will study the development of western civilization and American history during the first two college years. A course, *The Historian's Craft*, focuses on problems, methods, and philosophies of historians. The History curriculum permits considerable opportunity for electives both in the major and in the other liberal arts.

Honors in History

Qualified juniors and seniors are urged to follow a program of independent study guided by professors in the Department of History.

Your Future

While many majors hope to spend their professional lives as historians, a considerable number study history to broaden horizons and develop understanding of themselves and of past and present society. Upon graduation they may become businessmen or lawyers.

Historians Who Teach

Most majors intend to teach. Students in the College of Liberal Arts may take a sequence of courses offered in the College of Education which will prepare them to teach in the public schools; those not taking the education courses may teach in private secondary schools, or, after obtaining master's or doctor's degrees, in junior colleges and universities.

Historians Who Do Not Teach

Not all history jobs involve teaching. Some men and women work for museums, restoration projects, or archives. Others spend their lives in research and writing.

The Full-Time and Cooperative Plan Programs

History majors may pursue either a full-time or cooperative program of study, thereby qualifying for graduation in either four or five years. Cooperative jobs might be in locations such as Minute Man National Historical Park, Massachusetts Historical Society, and Statue of Liberty National Monument.

INDEPENDENT MAJOR

A student in the College of Liberal Arts has the opportunity to design his own program if he is able to demonstrate that none of the established programs provide preparation for the professional goal which he has set for himself. The Independent Major leads to the Bachelor of Arts degree only and must center on a discipline or combination of disciplines in the liberal arts.

A student interested in designing his own program should discuss his aims and ideas for an Independent Major with a counselor in the Liberal Arts office who will help assign him to one or more faculty advisers.

The following are among the criteria which an Independent Major must meet:

1. The proposal should be based on educational, professional, or vocational goals.
2. The proposed major should be comparable in depth and scope to a departmental major.
3. The proposed major should help meet the student's objectives.

JOURNALISM

Description

In this modern world it is evident that society relies increasingly on the mass media so that its members may keep abreast of rapidly changing conditions all around them. It is the role of the journalist to observe, understand, analyze, explain, report, and interpret, as well as to provide leadership in ideas and information through the many outlets of the mass media.

Type of Work

Graduates of a journalism program secure positions with newspapers, television, radio stations, general and specialized magazines, and other publications. In recent years allied fields have developed alongside the traditional media, providing rewarding careers for those with a journalism background. Such fields include public relations, publicity, industrial journalism, technical writing, and, of course, advertising and teaching.

Your Program of Study

A journalist should have a broad background of liberal arts courses on the undergraduate level, and most university-level journalism programs have long recognized this need. Along with this, he should have some undergraduate background and professional courses, but not to the point of overspecialization.

The generally accepted formula in journalism for the bachelor's degree is a combination of approximately 80 percent liberal courses and 20 percent professional courses. This combination is preferred by most graduate schools of journalism, as well as by professional journalistic leaders.

In the freshman year at Northeastern all courses are in the liberal arts, primarily the humanities. In each of the upper-class years the ideal arrangement is to take one journalism course each term with three liberal courses in the humanities, social sciences, and languages, or in a so-called disciplined area.

Because journalism thinking and skills can be better expanded and understood with the aid of a laboratory, upper-class Journalism majors are

encouraged to participate in the Cooperative Plan of Education. Co-op jobs with newspapers, radio and TV stations, news bureaus, and public relations offices provide a laboratory experience. This is quite important to one who wishes to be part of the world of communications. In addition, such experience gives a student a major advantage if he or she decides to seek admission to a graduate program in journalism following graduation from Northeastern.

Your Future

Many opportunities exist in the growing field of journalism. A Journalism major would be qualified for openings with daily and weekly newspapers, news departments of radio and TV stations, news bureaus, wire services, general and specialized magazines, industrial journalism, public relations, publicity, and many other fields not directly related to mass media. A journalism education actually provides an excellent background for many non-media fields where the communications process is important.

MATHEMATICS

Description

From programming and coding for digital computers to solving problems in engineering; from research on the behavior of the atom to calculating orbits of earth satellites—these are a few examples of the varied accomplishments and activities of those engaged in mathematics—one of the oldest and most basic fields of science, as well as one of the most dynamic and most rapidly growing.

Type of Work

Mathematics majors are employed in industry, educational institutions, insurance companies, mathematical laboratories, engineering research organizations, and government agencies. They do statistical, computational, and analytical work.

Your Program of Study

Your interest in studying an exact science such as mathematics must be supported by a school record which indicates that you have laid a strong foundation in this field.

During your freshman year the mathematics courses deal mainly with differential and integral calculus, supplemented by plane analytic geometry, and linear algebra. These provide the groundwork for a variety of courses in the upper-class years.

Since there are many fields in which mathematical work plays an important part, you should acquaint yourself with some of these areas. This may be done through the Cooperative Education Program and through introductory courses in such subjects as Physics, Chemistry, Mechanics, Electricity, and Economics.

Your Future

Outlook: continued rapid growth of employment in mathematics, especially for those with advanced degrees, which are required for many positions, particularly those in research and teaching. There are many opportunities in the electronics manufacturing field where mathematicians work with scientists and engineers on complex mathematical problems.

MODERN LANGUAGES

Description

Some students choose an academic program in Modern Languages because they are interested in elementary, secondary school, or college teaching, international business relations, government service, journalism, or library science. Others major in this field because of their interest in world affairs or travel, or because they are looking forward to creating the proper home atmosphere in which to bring up world citizens.

A major in Modern Languages requiring advanced courses in two languages is available to students who have acquired in high school a strong foundation in French, German, Italian, Russian, or Spanish. Those who mean to continue into graduate study will do well to have also two or three years of high school Latin.

Your Program of Study

The Department of Modern Languages offers in each of the five languages at least three full literature courses during the regular college year, and a conversational course.

The study of modern languages has a particular appeal for the person whose interests are not limited to his immediate neighbors and contemporaries. If you desire to become familiar with world affairs, to travel abroad, and to understand the customs and traditions of peoples in other countries, you will find great satisfaction in study and research in foreign languages.

Your Future

Many professional careers in addition to elementary and secondary school teaching, are open to the graduate who has majored in Modern Languages. Those who wish to teach in college must plan on graduate study. There are challenging opportunities in government service, international business relations, journalism, and library science. In each of these fields a knowledge of modern languages is either required or highly desirable.

PHILOSOPHY

Description

Philosophers from Socrates to the present time have studied the questions and the wider issues which arise out of human experiences and beliefs in all their rich variety—man's art, his religion, his moral values, his purposes, his science, and his social order. The philosopher's approach begins in his profound wonder about the meaning and importance of these experiences for human existence as a whole. Philosophy helps man to create, refashion, and justify the divergent beliefs about the nature of things. It makes him more aware that the kinds of beliefs he holds or rejects govern lives, careers, hopes, and fears.

In this age men have been philosophically reawakened by new and exciting developments in philosophy and in the physical and social sciences. Philosophers, through discussion and writing, reexamine and reinterpret such issues as the justification for belief in God, the nature of moral judgments of right and wrong, the questions surrounding the quest for knowledge and value, and the nature of the logic and methods of the sciences. Through his vigorous analyses, the philosopher questions, increases, and deepens human understanding and insight. One of his functions is to add meaning to the fragmentary details resulting from specialization.

Your Program of Study

Northeastern's program for a Philosophy major is designed to provide you with a balanced understanding of the nature of philosophy and particular philosophical problems which arise in the various arts and sciences. A maximum number of electives has been provided so that you may choose in accordance with your own background and interests.

In your sophomore year, you will begin your study of philosophy with a two-term History of Philosophy course designed as an introduction and as a preparation for more specialized study later. By the third or fourth year, you will find particular areas and seminars within philosophy which have special appeal for you.

Philosophy majors may pursue either a five-year co-op or a four-year full-time course of study.

Your Future

Upon graduation, some Philosophy majors go on to graduate school to prepare to teach not only philosophy but also subjects in many other fields. This major gives the student the opportunity to discover and communicate ideas through research, writing, and personal encounter.

Many select philosophy in order to develop a broad background in the humanities and to sharpen their critical abilities for later specialization in law, history, political science, education, and literature in graduate school. Other students find their background in philosophy an excellent prepara-

tion for the ministry, priesthood or rabbinate. Indeed, former Philosophy majors can be found in most of the major types of professional careers, including those in school, college, and university administration.

PHYSICS

Description

In physics one studies nature experimentally in order to develop a general theory of the universe. The physicist's laboratory extends from a bench microscope to the body of an exploding superstar, and the theories which he uses attempt to explain the forces that shape all of nature. For example, the theory of the chemical bond, and chemical and biological processes, as well as the formulas of engineering, are all derived from physics.

Physics should be of interest to every educated man because of its general nature. It is important to the philosopher interested in epistemology (the theory of knowledge), as well as to the man with natural curiosity about his world.

Type of Work

Professional physicists work in industry and in government laboratories on research, and in colleges and universities as teachers and researchers. At Northeastern the Department of Physics is especially strong in both theoretical and experimental high-energy (nuclear-particle) and solid-state physics. There is also a strong program in statistical mechanics, field theory (including general relativity), and nuclear theory.

Co-op students and graduates find jobs in the above field, many of them in the Department itself, as well as in other areas of physics: i.e., underwater sound, space physics, and plasma physics. Some graduates continue in the Northeastern Physics program and obtain the Ph.D. degree here. Others go to different graduate schools, such as Cornell, M.I.T., and Chicago, depending on their interests and abilities.

Program of Study

The program of study is quite flexible, reflecting the various interests of students majoring in Physics. The first course in Physics is common to all science and mathematics majors. It is a three-quarter course covering three areas: mechanics; fluid mechanics, heat, wave motion, and optics; and electricity and magnetism. It should be taken either with or after the three-quarter freshman Calculus course. Freshman Physics and Mathematics majors usually start it in the fall, but it can be begun in any quarter. Furthermore, only the first quarter is a prerequisite to the other two; the second and third quarters can be taken in reverse order.

The three-quarter introductory course is followed by two-quarter courses in physics and mathematics, and a two-quarter laboratory in General Physics. Beyond that, three courses in physics, three laboratories in physics and one course in mathematics are the only Departmental requirements

for the Bachelor of Arts degree. Most Physics majors will want to take more physics courses, and many more are offered, including Mechanics, Wave Motion and Optics, Thermodynamics, Modern Physics, Electricity & Magnetism, Quantum Theory, Mathematical Physics, and an additional laboratory course.

The Physics major can be taken as a four- or five-year program.

Your Future

Currently there is a falling-off in demand for all scientists and professionals, including physicists. Although it is difficult to predict job opportunities five and 10 years from now, the following facts should be considered.

1. Physicists are just beginning to understand the nature and dynamics of the physical universe. The aspiring researcher will find plenty to do in physics, assuming society will find the search for truth sufficiently important for it to support this search adequately.
2. Physicists should be able to make a contribution to the development of the *new* technology needed to solve problems resulting from the old technology if society decides to solve these problems.

There is also much overlapping between applied physics and engineering. Physicists, chemists, biologists, and engineers will frequently work on the same problems. However, when a new field must be developed, such as nuclear energy or the taming of the fusion ("H-Bomb") reaction, physicists are at an advantage because of the flexibility and fundamental character of their education. Majoring in physics does not necessarily imply making physics a career: one may end up in allied fields such as biophysics, chemical physics, medical physics, astrophysics, geophysics, oceanography, meteorology, or a completely new field of the future.

Physics Laboratories

The Northeastern University Physics laboratories are under the supervision of individual professors who are outstanding researchers in various fields of physics. Techniques, equipment, and ideas are all stimulating and up-to-date, from the general physics laboratory (sophomore year) to the advanced laboratory (senior year).

POLITICAL SCIENCE

Description

Political science is concerned with the study of political institutions, the social and economic forces which shape them, and the cultural context within which they operate.

The Department of Political Science at Northeastern University has three objectives: (1) to educate within the framework of the best liberal arts tradition; (2) to heighten a student's awareness of political forces in the environment and to sharpen his or her perception of a student's role as a citizen in a democratic society; and (3) to provide a solid academic foundation for those who elect political science or the law as a professional career.

Your Program of Study

Undergraduate work in the Department is designed to give students a broad and comprehensive exposure to the data of politics, while encouraging them to pursue extensive work in related social sciences. In addition to elective courses, they will pursue studies in comparative government, American government, international relations, public administration, and political theory. If they elect the Bachelor of Science program, they are required to take courses in quantitative analytical methods.

Your Future

For all students, the study of political science can be the gateway to a liberal education with its benefits of broadened interests, sharpened sensibilities, and a quickened sense of civic responsibility. If you have a special interest in politics, studies in this field provide excellent preparation for governmental services, the study of law, the teaching of government and related subjects, or for a political career.

For the student who wishes to pursue his professional studies at the graduate level, concentration in political science opens up many attractive opportunities. Opportunities for research are available in governmental research bureaus in the universities, in government agencies—state, local, and federal—and in private institutions teaching careers are opened. The growth of specialized agencies in international bodies like the United Nations calls for the skills of the political scientist. Individuals with specialized training in political science are in demand also in some less obvious areas: in the public service programming of educational and commercial television, in journalism, and in legislative study and public relations activities with private associations.

The Department will give assistance as professional objectives are planned and will help to alert the student to professional opportunities and the means for taking the greatest advantage of them.

PSYCHOLOGY

Type of Work

Psychologists study the way organisms behave and the reasons for their behavior. The profession of psychology includes a number of different

areas of specialization. Some psychologists direct their efforts toward the application of psychological knowledge and techniques to the solution of human problems, while the main concern of others is basic scientific research.

The majority of psychologists are engaged in providing services in clinical, counseling, industrial, educational, and engineering psychology. These applied areas are oriented toward helping not only individuals with severe emotional disorders, but also those with normal, everyday problems such as social, educational, and vocational adjustment. Employers for these psychologists include business and industry; clinics and hospitals; and local, state and federal governmental agencies. Some psychologists are self-employed.

Research-oriented psychologists concentrate their study and work toward understanding the behavior of man and lower animals through scientific experimentation. Their research activities are diverse and numerous. They are primarily employed by colleges and universities in a teaching as well as a research capacity. Opportunities for employment are also available in a variety of other public and private institutions.

Your Program of Study

The undergraduate program for Psychology majors at Northeastern is designed to meet a number of educational objectives. First, it provides preparation for graduate study leading to a variety of professional careers in psychology. Second, recognizing that not all undergraduate students majoring in Psychology can or want to become professional psychologists, the program provides training for individuals who want careers where a background in psychology is relevant and beneficial: i.e., in personnel work, advertising, social work, and teaching. Finally, the course of study provides a liberal arts major that should enable the student to understand himself and his world of experience more perceptively and sensitively.

In the freshman and sophomore years you will begin the study of your major with courses designed to acquaint you with the scope of modern psychology and give you the fundamental background for your later, more specialized, upper-class program. As an advanced student you will take courses which treat specific aspects of behavior in considerable detail. Among the advanced courses are Abnormal Psychology, Experimental Psychology, and seminars dealing with the development of psychology as a behavioral science and contemporary psychological issues. You will have a choice of upper-class electives in such fields as personality development, social influences on behavior, principles of growth and adjustment, physiological determinants of behavior, and principles of psychological testing.

In the experimental courses you will study scientific techniques for investigating human and animal behavior. You may also have the opportunity to conduct your own research under the guidance of one of the faculty members.

In the cooperative work phase of your studies, all efforts will be made to provide you with valuable and relevant work experiences in research laboratories, clinics, mental hospitals, or social service agencies.

Your Future

The field of psychology offers a wide variety of opportunities for both men and women. Many factors point to the continued expansion of the profession, which tripled in size between 1945 and 1955 and has since grown by almost 1,500 annually. However, an advanced degree has become a necessity for professional employment. Approximately 70 percent of the 25,000 members of the American Psychological Association, the national society of professional psychologists, hold the doctorate degree. While there will continue to be employment possibilities for psychologists with master's degrees, all indications point to an increasing demand for the doctorate degree as the standard educational requirement.

The employment outlook for the 1970s will depend upon such trends as the following.

1. Continued utilization by schools, government agencies, and private industry of contributions that can be made by psychologists.
2. Funding to meet the growing concern about mental health needs.
3. The availability of government or foundation grants to sponsor psychological research in universities and private industry.
4. Continued expansion of high school, junior college, college, and university facilities employing psychologists as teaching and counseling personnel.

Psychology Laboratories

The experimental facilities are well equipped for psychological demonstrations, training, and research with human and animal subjects. Instruction is provided in human and animal learning, physiological psychology, sensation, and perception, with emphasis on the visual and auditory processes and personality and development.

SOCIOLOGY AND ANTHROPOLOGY

Description

Sociologists and anthropologists study the various forms of group arrangement found in the world of man—families, communities, tribes, and nations; and the wide variety of organization types—religious, business, professional, and others. The origin and growth of these groups are traced and analyzed, and their activities are considered as they relate to the influence they have on their members.

Type of Work

Within the Department of Sociology and Anthropology, you can enroll in a wide range of courses which provides background for courses in such

professional fields as medicine, college and secondary school teaching, race relations, social research, law, international relations, history, human relations, social work, and field research in other cultures. Groundwork in sociology and anthropology can be also increasingly valuable for the ministry, priesthood, and rabbinate, and will be directly relevant to almost any career in Federal or state government, from poverty programs to the foreign service.

Your Program of Study

Two "concentrations" are possible within this Department, although there is much overlapping in course requirements which will allow flexibility in planning your courses.

As a Sociology concentrator, you will have a full complement of theory and research courses in this field and will deal primarily with theoretical and applied aspects of contemporary urban and industrial societies. If you are an Anthropology concentrator, you will pursue your studies more in the direction of tribal and peasant societies, as well as with economic and technological change in developing societies of the world.

Your Future

A majority of sociologists and anthropologists are employed by colleges and universities in teaching and research; many others work for Federal, state, local, or international government agencies; some are employed in private industry.

Employment opportunities are in college teaching or in social action programs. Other employment opportunities may exist for research workers specializing in such areas as social psychology, urban sociology, community development, and educational and industrial sociology, as well as in the field of criminology.



Bachelor of Engineering Technology

Electrical Engineering Technology

Mechanical Engineering Technology

Associate Degree

Aviation Technology



William F. King, Director

Lincoln College

Lincoln College prepares students to enter the technological world as active participants whose mission is, simply stated, to get things done. The engineering technologist works with the professional engineer, scientist, medical doctor, supervisor, and craftsman in converting scientific knowledge and craftsmanship into products and techniques. Fundamentals are related to current practice, providing a supportive “why” for the practical “how”. At the same time, study of the social sciences and humanities gives an opportunity for students to develop an awareness of the social, economic, and political influences that are part of the real world.

Aims

The structure of the Engineering Technology curriculum is based upon the dual need for relevant technical skills and the foundation for future growth. Engineering technology education will assist students to:

1. Understand the scientific principles that govern the current technology of that particular branch of engineering which they select.
2. Develop competence in the application of technology to problem-solving.
3. Communicate effectively the important implications of technological advancements.
4. Acquire the motivation for continued relevance in technical skills.

Women in Engineering Technology

Many women enter the technology field each year. Both government and industry provide positions of responsibility for women technologists. Any young woman with technical or scientific interests should consider engineering technology as a career.

Degree Granted

Lincoln College operates on the Cooperative Plan and offers five-year programs of study leading to Bachelor of Engineering Technology degrees in Electrical and Mechanical Engineering Technology.

Your Freshman Year in Lincoln College

The freshman year in Engineering Technology consists of the prescribed courses shown below. Study during the first year will build your understanding of mathematics and the physical sciences, and improve your ability to communicate ideas both by verbal and graphic means.

Since the first year of study is identical for all technology students, you may change your choice of specialization at the end of the freshman year without loss.

Your freshman courses act as a foundation for your upper-class studies which will develop your basic understanding of concepts in the technical application of the sciences. They will also introduce you to current technical hardware and its applications. About four fifths of your upper-class program is devoted to scientific and technological study, and about one fifth to humanistic-social courses, with the aim of balancing your growing technical proficiency with an appreciation for the nontechnical aspects of society and culture.

Cooperative work in the branch of engineering which you choose will begin upon completion of your freshman year and continue throughout your remaining upper-class years. Your work assignments during this time will prove most valuable in helping you to integrate the important elements of both a technical and a liberal education.

Sample Freshman-Year Program of Studies in Lincoln College

<i>First Quarter</i>	<i>Second Quarter</i>	<i>Third Quarter</i>
10.307 Algebra & Trig. I	10.308 Algebra & Trig. II	10.320 Calculus I
11.317 Physics I	11.318 Physics II	11.319 Physics III
30.113 Freshman Writing	30.114 Intro. to Lit.	30.115 Great Themes in Lit.
9.451 Graphics I	9.452 Graphics II	9.453 Comput. Prog.
	11.173 Physics Lab. I	11.174 Physics Lab. II

In addition to the above courses, a student may elect to take Basic ROTC.

Please see back of catalog for full course descriptions.

ELECTRICAL ENGINEERING TECHNOLOGY

Description

Electrical engineering technology deals with the design and operation of equipment and systems related to power, communications, data processing, and electrical control. Its major functions are:

1. The generation, transmission, and distribution of electrical energy for light and power purposes.
2. The development and production of equipment for telephone, radio, television, radar, and communication.
3. The design and construction of data-processing systems and analog or digital computers.
4. The application of electrical and electronic devices in the control of processes and manufacture.

Type of Work

Employment opportunities for the electrical engineering technology graduate are in public and private laboratories; engineering consulting groups dealing with industrial and plant applications; design organizations dealing with operation and manufacture; sales engineering; and the electric utility industry.

Your Program of Study

Since electrical engineering technology derives many of its fundamentals from developments in the pure sciences, your program of study will begin with basic courses in mathematics and physics. In addition the freshman year will include literature and engineering graphics, to aid in developing your self-expression.

In the upper-class years your courses will be divided into five related sequences: circuits and systems, including feedback control; electronics and communications, including an introduction to solid-state physics; electromagnetic field theory and microwave devices; energy conversion, emphasizing electromagnetic devices; and laboratory work associated with all of the foregoing. Current practice is stressed.

In the senior year electives are offered in order that you may have the experience of depth and specialization.

Your Future

Opportunities for technologists are increasing at a faster rate than for any other occupational group: a 50 percent increase is expected in the next five years. More than 100,000 technologists will be needed each year, whereas schools now graduate only 25,000 per year.

Since this program has been designed to prove an educational experience different from that of the College of Engineering, it does not prepare

the student for direct admission into graduate schools of engineering. In most cases, however, graduates will be eligible for programs such as business, law, and education. In exceptional cases students may gain admission to engineering graduate programs by taking additional undergraduate course work in engineering.

Electrical Engineering Laboratories

The Northeastern electrical engineering laboratories are patterned after a composite of typical industrial research and development laboratories. Boasting a wide variety of modern testing and measuring equipment, the laboratories are an excellent adjunct to the classroom. Here the student may simulate or fabricate devices or systems which have been studied in his lecture courses.

From light machinery and power equipment to microwave precision systems, students plan and pursue their projects in the laboratory. The recent acquisition of the digitally programmed analog computer also permits the study of larger or more complex systems than can be realized in the laboratory itself.

The laboratory programs are organized to provide an atmosphere of freedom, and students can exert considerable influence on their own study efforts.

MECHANICAL ENGINEERING TECHNOLOGY

Description

Mechanical engineering technology deals with the harnessing of power resources by means of machinery to perform useful work. In contrast to civil engineering, which deals primarily with static forces and structures, mechanical engineering is more concerned with the motion and kinetics of devices which are activated by hydraulic, electrical, mechanical, or thermodynamic forces. Major functions of the mechanical engineering technologist are:

1. Design and installation of all kinds of machinery, from pocket watches to the largest of steel boring mills.
2. Development and production of engines and transport equipment (automobile, aircraft, ship, railway, etc.).
3. Construction and operation of furnaces and boilers, as well as heating and air-conditioning equipment, for the control of atmospheric and environmental conditions.

Type of Work

Employment opportunities for Mechanical Engineering Technology graduates are in the following areas: 1. Research and design development; 2. Production, operation, testing, or control; and 3. Installation, mainten-

ance, and sales. In performing these functions, graduates of the Mechanical Engineering Technology program work in close association with professionals in the field. They may develop technologically to function independently and hold positions of managerial responsibility.

Mechanical Engineering Laboratories

The Mechanical Engineering Department includes the following laboratories:

Materials and Metallurgy Laboratories—These laboratories are well equipped to treat the physical examination of materials and their structures. The equipment includes modern apparatus for vacuum melting technology, X-ray diffraction, and thermal expansion studies, two research metallographs, an electron microscope, and a fluid-to-fluid extrusion press.

Fluid and Gas Dynamics Laboratory—Designed to study aerodynamic and hydrodynamic phenomena such as vortices, separation streamlines, and shock waves. Equipment includes an aerodynamalog, an axial flow fan, shock tube, subsonic wind tunnel, and a supersonic wind tunnel.

Materials Testing and Stress Analysis Laboratories—Equipped to handle both the destructive and nondestructive testing of materials, this laboratory has a 300,000-lb. Universal testing machine provided with an automatic electronic stress-strain recorder and a high-temperature tensile test furnace.

Stresses and strains may be determined experimentally by the use of strain gage, photoelastic, photostress, and brittle lacquer techniques.

Recent additions include a fatigue testing machine of 2,000-lb. capacity, and vibration testing units.

Heat Engineering Laboratories—These laboratories include:

1. A refrigeration unit which may also operate as a heat pump.
2. Two solid injection diesel engines provided with a continuous oxygen analyzer, one equipped with a strain gage torque meter.
3. A CFR fuels research engine equipped with a strain gage pressure transducer.
4. A 60-h.p. Rover gas turbine with automatic controls and Froude dynamometer.
5. Apparatus for study of steam-to-water heat transfer, comparison of film versus dropwise condensation, heat transfer to a boiling liquid, and thermocouple recovery factor.
6. A thermoelectric generator to study the direct conversion of heat into electrical energy.
7. A thermoelectric refrigeration test facility for development of single and multistage thermoelectric coolers.
8. Curtis steam turbine and condenser.

Automatic Control Laboratory—This new area includes:

1. A feedback control system.
2. Analog computers for simulation of engineering problems, fluid power testing units.

Your Program of Study

Since machinery is predominantly the concern of the mechanical engineer, your program of study is designed to give you considerable training in the principles underlying the design and operation of engines, power transmission devices, machine tools, and other machinery. This, of course, implies a thorough study of the physical laws concerning motion and transfer of energy. Applied mechanics, thermodynamics, and study of materials will occupy prominent places in your program.

Your studies will thus provide you with a broad foundation in those fundamental subjects essential to the understanding of current practice. In your junior and senior years you will have considerable elective choice and opportunity for specialization.

Your Future

Opportunities for technologists are increasing at a faster rate than for any other occupational group: a 50 percent increase is expected in the next five years. More than 100,000 technologists will be needed each year, whereas schools now graduate only 25,000 per year.

Since this program has been designed to provide an educational experience different from that of the College of Engineering, it does not prepare the student for direct admission to graduate schools of engineering. However, in most cases graduates of this program will be eligible for programs such as business, law, and education. In exceptional cases students may gain admission to engineering graduate programs by taking additional undergraduate course work in engineering.

AVIATION TECHNOLOGY

Lincoln College also offers on a full-time basis a program in Aviation Technology leading to the Associate Degree. This program operates out of the Norwood Municipal Airport in cooperation with Wiggins Airways, Inc. Students having a strong interest in flying as an integral part of their careers should investigate this unique opportunity by communicating with the Director, Lincoln College Aviation Program, at (617) 762-5690.



"The essence of nursing is caring for humanity. Excellence in nursing can be achieved only through the preparation of men and women who are knowledgeable in liberal arts as well as the science upon which the practice of nursing is founded."

Juanita O. Long, Dean, College of Nursing



Juanita O. Long, Dean

The College of Nursing

The College of Nursing, first in the nation to operate on the Cooperative Plan, was established by Northeastern University in the fall of 1964. The College offers two distinct educational programs which prepare individuals to practice nursing, an Associate Degree Program and a Baccalaureate Degree Program.

The Associate Degree Program, established in 1964, which is three years in length and leads to the degree of Associate in Science, has as its purpose the preparation of a beginning practitioner whose goal is to give direct patient care at the technical level.

The Baccalaureate Degree Program, initiated in 1966, leading to the degree of Bachelor of Science, is designed to prepare students for professional nursing practice. The curriculum is five years in length and serves as a foundation for further professional development and graduate study.

Selection of Your Program

You are encouraged to acquaint yourself with the two programs offered by the College of Nursing. An understanding of both programs will assist you in selecting the one which will best contribute to your personal satisfaction and success as you continue your education beyond high school. Counselors in the Department of Admissions will be glad to discuss the programs with you and to help you in making your decision.

Method

Freshmen in the College of Nursing remain on campus for three consecutive quarters of academic study, and students in succeeding years

alternate periods of study at Northeastern with periods of work in participating health agencies. The quarters of cooperative employment afford a valuable work experience, as well as a source of income. Academic studies in both the Associate Degree and the Baccalaureate Degree Programs include courses in nursing and general education. Under the guidance of the College of Nursing faculty, clinical experiences in the care of patients are introduced in the first year of the Associate Degree Program and in the second year of the Baccalaureate Degree Program.

Type of Work

It is expected that the majority of new graduates of either program will be employed as staff nurses in a variety of health agencies. The graduate of the Baccalaureate Degree Program has the academic prerequisites for graduate study in nursing.

Your Future

The demand for nurses is increasing steadily. You can be confident that you will be able to secure a position in the field of your competency, a choice that will be both satisfying and challenging.

Degrees Granted

At the successful completion of your selected program of study you will be awarded the degree of Associate in Science or Bachelor of Science. Graduates of both programs are eligible to take the State Board Examination required to become a Registered Nurse.

The Associate Degree Program

Your freshman year will be one of full-time study and will include courses in nursing, liberal arts, and the biological and social sciences. Selected clinical experiences in the nursing care of patients are an integral part of the first year. Special emphasis is placed upon the responsibility of the nurse in the promotion of health and the development of basic nursing skills.

Students interested in the Licensed Practical Nursing Transfer Program toward the Associate Degree should write to the Admissions Department for further information.

Upper-Class Years

During your second and third years in the College, you will progress through alternate quarters of classes at the University and cooperative work assignments in specific hospitals. Care of patients in the hospital setting is the principal focus of the laboratory period. Cooperative work assignments are entirely supplemental to these experiences, and will enhance your ability to function as a member of the health team.

Throughout your three years in the University, liberal arts, sciences and nursing are interwoven into a meaningful whole. This balance of liberal and technical education provides a firm foundation upon which you will

practice nursing in these changing times. The content of the Associate Degree Program is not identical to the first three years of the Baccalaureate Program; therefore, direct transfer from the Associate to the Baccalaureate Program or the Baccalaureate to the Associate Program is not feasible.

Sample Freshman-Year Program of Studies in the Associate Degree Program

<i>First Quarter</i>	<i>Second Quarter</i>	<i>Third Quarter</i>
80.101 Fund. Nursing	80.102 Fund. Nursing	80.103 Fund. Nursing
18.107 Integ. Science	30.113 English	30.114 English
19.102 Basic Psychology	18.108 Integ. Science	18.109 Integ. Science
	19.141 Growth and Devel.	19.142 Growth and Devel.

Please see back of catalog for full course descriptions.

The Baccalaureate Degree Program

This five-year curriculum on the Cooperative Plan provides a broad general education which includes a foundation in the sciences and humanities underlying the practice of nursing. It is designed to prepare students to provide professional nursing care in a variety of settings. In addition, the program serves as a basis for further professional development and graduate study essential to leadership positions in nursing.

Your Freshman Year

In the first year, learning experiences are planned that encourage personal involvement of each student in looking at his or her own growth, progression, and development. Community, national, and world health problems, as well as social trends and their implications for nursing, provide the students with a foundation for successive nursing courses.

Upper-Class Years

You will participate in the cooperative feature of the program throughout your four upper-class years. During the periods of academic study, liberal arts courses are concurrent with those in the Nursing major. The nursing courses include clinical laboratory experiences which are planned to implement principles presented in classroom and discussion sessions. During the periods of cooperative employment, you will work in selected health agencies.

To qualify for the degree of Bachelor of Science, you must complete 11 quarters of academic study and seven quarters of cooperative employment.

**Sample Freshman-Year Program of Studies
in the Baccalaureate Degree Program**

First Quarter

18.141 Biology
23.101 Western Civ.
30.113 English
80.201 Nursing

Second Quarter

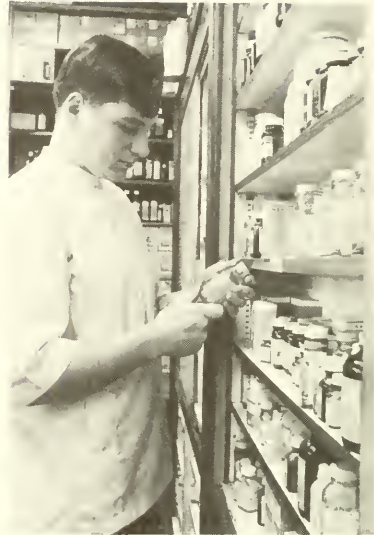
12.106 General Chem.
18.142 Biology
30.114 English
80.202 Nursing

Third Quarter

12.107 General Chem.
18.148 Anatomy
23.102 Western Civ.
80.203 Nursing

Please see back of catalog for full course descriptions.





Bachelor of Science
*Management in Health
 Agencies and
 Institutions
 Medical Record
 Administration
 Medical Technology
 Pharmacy*

Associate in Science
*Cytotechnology
 Dental Hygiene
 Medical Laboratory
 Technology
 A.D. (M.L.T.)
 Radiologic Technology
 Respiratory Therapy*

LeRoy C. Keagle, Dean

The College of Pharmacy and Allied Health Professions

Accreditation

Each of the programs offered by the College is accredited by the appropriate professional group. The College holds membership in both the American Association of Colleges of Pharmacy and the Association of Schools of Allied Health Professions.

Aims

Northeastern University recognizes the great need for well-educated allied health professionals. The College of Pharmacy and Allied Health Professions is pledged to meet this need through its program of academic and cooperative work and extracurricular activities, all of which are designed to prepare students effectively to become professional practitioners, to enter graduate schools, and to accept employment in the many areas responsible for the delivery of health care.

Method

The five-year curriculum for the bachelor's degree and three-year requirement for the associate degree provide the full amount of academic learning time required to equip the student with the scientific and technical knowledge necessary to practice his chosen profession effectively and to meet licensure or registration requirements. The "side-by-side" study for the various health professions gives students a clearer understanding of how their work fits into the broad category of health care.

The Cooperative Plan

The Cooperative Plan will enable you to associate with professional practitioners under actual working conditions. Such practical experience will give greater meaning to your academic program of study.

Many allied health practitioners, like physicians, must meet certain requirements to obtain licensure from the state in which they desire to practice. Others must meet professional registration requirements. Such requirements may include graduation from an accredited program, passing of a licensure or professional registration examination, and completion of certain internship obligations.

The internship requirements of programs such as Pharmacy can be partially or completely satisfied during cooperative work periods.

Degrees Granted

The degrees of Bachelor of Science, Bachelor of Science in Pharmacy, and Associate in Science are awarded to qualified candidates.

Your Freshman Year in the College of Pharmacy and Allied Health Professions

Your freshman year for baccalaureate programs will include a core curriculum generally including English, General Biology, Basic Mathematics, a liberal arts elective, and General Chemistry. Associate degree programs will vary depending on their specific nature, but will generally include some core courses. Like other freshmen, you may also elect Basic ROTC Training or Physical Education if you desire.

Your choice of major will have some bearing on your final program. It is important that you discuss your area of interest with an admissions counselor or the director of the selected program.

PHARMACY

Ninety percent of the drugs on the market today were unknown ten years ago. This is an indication of the vast scope of knowledge which today's pharmacists must have at their command, whether they are at work in the familiar corner drugstore or in one of the other fast-developing fields open to members of this profession. As part of their responsibilities, they are expected to be expert advisers to other health professionals concerning the use of these new drugs. Because of the rapid expansion in medical knowledge in the past few years, colleges of pharmacy have assumed an even greater role in educating patient-oriented pharmaceutical personnel.

Type of Work

A majority of the pharmacists in America today work in retail pharmacies. A large number are also employed in such rapidly growing branches of the profession as hospital and industrial pharmacy. There are

many careers open to pharmacists in the Armed Forces, government agencies, professional associations, and colleges.

Pharmacy is not restricted to men. Women now make up 24 percent of the enrollment in pharmacy colleges, with the number increasing yearly. They comprise nearly eight percent of all practicing pharmacists and 33 percent of hospital pharmacists.

Your Program of Study

Your program of study in Pharmacy will not only prepare you to operate a retail pharmacy, but will also equip you for the other occupations mentioned above. It will also provide an adequate foundation for graduate work.

The required curriculum includes instruction in each of three natural divisions: (1) nonscientific courses in general education (the humanities and social studies); (2) mathematics and the basic physical and biological sciences; and (3) courses in the areas of professional instruction: pharmaceutical chemistry, pharmacognosy, pharmacology, pharmacy, and pharmacy administration.

Your Future

Most pharmacy graduates can expect to find employment readily. There are increased demands for pharmacists in community practice, hospital pharmacy, and other health care agencies.

Most significant rise—employment in hospitals.

In both industrial and hospital pharmacy, the demand will be greatest for pharmacists with graduate education.

The long look ahead—continuous growth in the profession.

Pharmaceutical Sciences Laboratories

The College is housed in the Mugar Life Sciences Building on the Main Campus of the University, where the services of all other divisions of the University are available to the students. This wing was built and equipped at a cost of \$2,250,000 and is considered one of the finest physical facilities devoted to pharmaceutical education.

Four floors of the five-story wing contain staff offices, classrooms, animal quarters, storerooms, and fully equipped laboratories for undergraduate instruction in General and Physical Pharmacy, Manufacturing Pharmacy, Prescription Pharmacy, Pharmacy Administration, Medicinal Chemistry, Pharmacognosy, and Pharmacology.

In addition, specially designed research laboratories are available to graduate students and faculty in the aforementioned areas of instruction. Also, a modern and well-equipped radio-isotope laboratory is available for instruction and research in radiological health.

Sample Freshman-Year Program of Studies in Pharmacy

<i>First Quarter</i>	<i>Second Quarter</i>	<i>Third Quarter</i>
10.101 Basic Math.	10.102 Basic Math.	10.103 Basic Math.
12.106 Gen. Chem.	or	or
30.113 English	10.106 Calculus	10.107 Calculus
71.201 Pharm. Orient.	12.107 Gen. Chem.	18.132 Biology
L.A. Elective	18.131 Biology	30.114 English
	71.202 Pharm. Orient.	L.A. Elective

In addition to the above courses a student may elect to take Basic ROTC.

Please see back of catalog for full course descriptions.

MEDICAL RECORD ADMINISTRATION

Description

The medical record administrator is a vital member of the hospital team. He or she is responsible for organizing and managing medical record departments; providing statistics and adequate, complete medical records; cataloging diseases and operations for research; designing recovery systems; and providing instruction for medical research and clinical evaluation.

The medical record administrator's responsibility is as follows:

1. To design health information systems.
2. To plan, organize, and direct medical record sciences.
3. To develop, analyze, and evaluate medical records and indexes.
4. To cooperate with the medical staff in developing methods for evaluation of patient care.
5. To cooperate with the medical and administrative staff in research projects utilizing health care information.

Type of Work

The medical record administrator is found in many types of health facilities: heading medical record departments in hospitals, nursing homes, health centers, and satellite clinics; performing staff functions for regional planning councils or health insurance organizations; serving on faculties of colleges or schools; and acting as consultant to business in developing systems and equipment for use in hospitals.

Your Program of Study

The Medical Record Administration Program leads to a Bachelor of Science degree in five years on the Cooperative Plan. This course of study prepares students to take the registration examination given by the Ameri-

can Medical Record Association to become a registered record administrator and use the initials R.R.A. after their name.

Courses at the University will consist of liberal arts subjects, plus a combination of science and business courses, including Anatomy and Physiology, Management and Organization, and Electronic Data Processing. The professional work includes such courses as Hospital Law, Medical Terminology, Foundations of Medical Science, Medical Record Science, and Organization and Management of the Medical Record Department.

In addition to academic courses, the student spends 300 hours in applied medical record science at an affiliated hospital. The Medical Record Administration Program is approved by both the American Medical Association and the Council on Medical Education of the American Medical Association.

Your Future

Job opportunities for medical record administrators are unlimited. There are employment opportunities in hospitals, universities, businesses, and neighborhood health centers, and consulting positions connected with extended care facilities and nursing homes.

Those who wish to travel may find positions in other countries with the Peace Corps, Project Hope, and American companies abroad. They may also work in developing schools for medical record administrators overseas. The introduction of computers in hospitals has made the job of the medical record administrator challenging, exciting, creative, and constantly changing.

**Sample Freshman-Year Program of Studies in
Medical Record Administration**

<i>Quarter 1</i>	<i>Quarter 2</i>	<i>Quarter 3</i>
18.131 Basic Animal Biology	18.132 Basic Animal Biology	30.114 Intro. to Literature
30.113 Freshman Writing	22.101 Political Science	23.102 Western Civilization
23.101 Western Civilization	10.102 Math.	or Modern Language
or Modern Language	21.100 Principles of Sociology	10.103 Math.
10.101 Basic Math.	87.132 Dynamics of Health Care	22.102 Political Science
87.131 Dynamics of Health Care		87.133 Dynamics of Health

In addition to above courses a student may elect to take Basic ROTC.

Please see back of catalog for full course descriptions.

Medical Laboratory Science

MEDICAL TECHNOLOGY

Description

In every area of medicine, the medical technologist is a vital member of the medical team. Working with the physician, the medical technologist performs laboratory analyses which aid in the detection, diagnosis, and treatment of disease. Utilizing a strong foundation in the biological and chemical sciences, the technologist performs complex clinical laboratory investigations.

Type of Work

The duties of the medical technologist may include testing of blood for transfusions, preparing vaccines, identifying bacteria and parasites, examining blood for malignant cells, and analyzing tissues and body fluids for inorganic and complex organic chemical substances. The individual who holds a baccalaureate degree will also be employed in medical laboratory educational and supervisory positions.

Your Program of Study

Students will enter the College of Pharmacy and Allied Health Professions. Medical Laboratory Science students, while working toward the Bachelor of Science degree, will register for classes during 12 quarters. The additional quarter and two interim weeks are necessary for students to complete the required academic courses, for eligibility to write the certification examination in medical technology, M.T.(A.S.C.P.). It is suggested that Medical Laboratory Science students take this additional quarter during the summer following the freshman year. However, students may arrange courses so that this additional quarter is taken during the co-op period of their senior year or during any summer co-op period.

By the end of the summer quarter preceding the senior year, students must have completed all the necessary nonscience and basic professional course requirements. Junior-year students may elect advanced medical laboratory science courses and applied hospital study completion of the appropriate prerequisites. Applied study in hematology, microbiology, and clinical chemistry will be available in the New England Deaconess Hospital and New England Baptist Hospital Medical Technology Programs in Boston.

The Medical Technology program is approved by the Board of Schools and the Council of Medical Education of the American Society of Clinical Pathologists and the Council of Medical Education of the American Medical Association. After satisfactory completion of the five-year program, students will be eligible to write the Medical Technology Examination given by the Registry of Medical Technologists.

Your Future

Medical technologists find employment opportunities in clinical laboratories and research laboratories in universities, medical schools, and pharmaceutical firms. Those who wish to travel may work with the Peace Corps, Project Hope, foreign missions, and private companies having hospital facilities abroad. There is an ever-increasing demand for qualified persons to teach in hospital schools of medical technology and colleges and universities. Graduates from this broad and intensive program quickly rise to supervisory positions.

MEDICAL LABORATORY TECHNOLOGY, A.D.(M.L.T.)

Description

The newest professional category in the clinical laboratory is that of the medical laboratory technician. He or she has had at least two years of college and holds an associate degree. The medical laboratory technician will perform more complicated laboratory procedures than a laboratory assistant, but will not undertake the supervisory and educational responsibilities of a medical technologist.

Type of Work

A medical laboratory technician, A.D.(M.L.T.), will perform routine chemical, microbiological, and hematological procedures in hospital laboratories.

Your Program of Study

This program is available on a three-year cooperative plan, and includes Biology, Human Physiology, Chemistry, and the Basic Medical Laboratory Science courses. Supervised clinical experience is an integral part of the program.

Successful completion of the didactic and clinical portions entitles the graduate to write the appropriate examination of the Board of Registry of the American Society of Clinical Pathologists. Upon successful completion of college courses, the designation A.D.(M.L.T.) is given.

Your Future

Employment opportunities can be expected to be widespread because of the general demands for laboratory personnel. Areas of employment include large private and hospital clinical laboratories, and physician in-office laboratories. The Associate Degree in Medical Laboratory Technology provides a stepping-stone by which one may continue his education to become a medical technologist.

CYTOTECHNOLOGY

Description

Cancer, a disease of disordered cell growth, is apparent with microscopic examination in its earliest stages. Cytology is the study of cells, and the cytotechnologist concentrates upon the microscopic examination of cell samplings for determinations of cancerous and benign tumor cells. Northeastern's three-year program leads to an associate degree.

Type of Work

A majority of cytotechnologists work in hospital clinical laboratories. Employment is also available in physicians' private offices, private laboratories, and research facilities. The work requires patience, precision, and ability to work alone with minimal supervision.

Your Program of Study

During the two-year Cytotechnology Associate Degree program, the curriculum will be concentrated in the biological sciences. An additional 12-month professional segment will include advanced studies in the historical background of cytology, cytology as applied in clinical medicine, and in areas of anatomy, histology, embryology, and cytophysiology. This program is offered at the Boston School of Cytotechnology. This school was established in a combined effort by seven of the teaching hospitals in the Greater Boston area.

Upon successful completion of the 12-month professional curriculum, the student is eligible to take the certifying examination given by the Board of Registry, American Society of Clinical Pathologists.

Your Future

Thousands of skilled scientific assistants are needed in pathology laboratories to work as cytotechnologists, screening slides for the cellular abnormalities that are the warning signs of cancer. Opportunities exist in private and public laboratories and industries. The cytotechnology graduate may continue his education toward a baccalaureate degree.

Sample Freshman-Year Program of Studies in Medical Laboratory Science

Medical Technology, Medical Laboratory Technology, and Cytotechnology

<i>Quarter 1</i>	<i>Quarter 2</i>	<i>Quarter 3</i>
18.131 General Biology	18.132 Animal Biology	10.183 Calculus
10.104 Fund. of Math.	10.105 Fund. of Math.	or
or	or	*12.105 Anal. Chem.
10.105 Calculus	10.182 Calculus	or
12.103 General Chemistry	12.104 Gen. Chemistry	*12.171 Anal. Chem.
or	or	87.101 Basic Med. Lab
12.106 General Chemistry	12.107 Gen. Chemistry	Science
30.113 English	87.100 Lab. Med. Orient	Modern Language
	Modern Language	or
	or	Elective
	Elective	

*Optional for Cytotechnology students.

DENTAL HYGIENE

Description and Opportunities

The dental hygienist is an important member of the dental health team. At the direction of the dentist, she is licensed to render direct preventive services to the patient. Her services include administering dental prophylactic treatment, preparing dental radiographs, and teaching prescribed methods of maintaining dental health.

Endowed with a sincere interest in people and a manner that reflects understanding and friendliness, a young woman who is qualified to render these services can look forward to a professional career that offers the special satisfaction that comes from being a respected member of a health team.

For the dental hygienist who is interested in teaching dental health in schools and other public institutions, the baccalaureate degree program is important. Not only does she have the personal satisfaction of working with teachers and health workers in promoting better health for the community, but she is frequently given special status with the same rights and privil ges as teachers and other health educators.

New schools of dental hygiene are rapidly developing throughout the United States, and dental hygienists with degrees in education are in increasing demand as clinical instructors and administrators of their programs.

Program

The Forsyth School for Dental Hygienists conducts a program of dental-hygiene education and general education in cooperation with Northeastern

University. Students in this two-year program attend classes both at the Forsyth Dental Center and at Northeastern's immediately adjacent campus on Huntington Avenue. Graduates of the program will receive the Certificate in Dental Hygiene from Forsyth and the degree of Associate in Science from Northeastern University. Students who are interested in this program should make direct contact with the Forsyth School of Dental Hygiene.

Sample Freshman-Year Program of Studies in Dental Hygiene

<i>First Quarter</i>	<i>Second Quarter</i>	<i>Third Quarter</i>
12.101 General Chemistry	12.102 General Chemistry	18.120 Microbiology
18.114 Functional Human Anatomy	18.115 Functional Human Anatomy	19.102 Psychology
DH-01 Dental Anatomy	DH-02 Dental Anatomy	DH-09 Head & Neck Anatomy
DH-20 Radiology	DH-40 Nutrition	DH-28 Dental Materials
DH-11 Dental Hygiene	DH-05 Histology	DH-13 Dental Hygiene
DH-11C Clinical Dental Hygiene	DH-12 Dental Hygiene	DH-13C Clinical Dental Hygiene
	DH-12C Clinical Dental Hygiene	

Please see back of catalog for full course descriptions.

Bachelor of Science Degree

Students who complete the two-year associate degree program may apply their credits toward the degree of Bachelor of Science in Education with a major in Health Education. This three-year curriculum on the Co-operative Plan is taken at Boston-Bouv  College. In addition, students who complete the two-year program may apply their credits toward a Bachelor of Science degree in Northeastern's University College.

RADIOLOGIC TECHNOLOGY

The College of Pharmacy and Allied Health Professions may announce a full-time degree program for radiologic technologists in the near future. Prospective students interested in this area of study should make inquiry at the Office of the Associate Dean of Allied Health Professions.

MANAGEMENT IN HEALTH AGENCIES AND INSTITUTIONS

For information about this program, communicate with the Office of the Associate Dean of Allied Health Professions or with Northeastern's University College.

RESPIRATORY THERAPY

Respiratory therapy, formerly known as inhalation therapy, is the most rapidly growing of the health professions. It is concerned with the diagnosis and treatment of acute and chronic lung disease occurring in patients of all ages, from newborn babies to senior citizens. Practitioners must be able to apply knowledge of basic sciences in order to use respirators, oxygen equipment, humidifying devices, and diagnostic tools with patients in various health care settings.

Type of Work

Most respiratory therapists work in hospitals. Their responsibilities include providing direct minute-to-minute care to patients in continuous respirators, treating some respiratory problems with intermittent therapy, teaching the patient with chronic disease to maintain his own care at home, working with outpatients, using special respiratory function equipment to aid in diagnosis, and maintaining sophisticated electronic and mechanical devices.

Therapists concern themselves with all aspects of respiratory care. They may spend part or all of any one day in the emergency room, newborn nursery, children's wing, outpatient department, intensive care unit, or pulmonary laboratory. As the field expands, therapists are in increasing demand in extended care facilities, community health agencies, and research laboratories.

Your Program of Study

The Respiratory Therapy Program leads to the Associate in Science degree in three years on the Cooperative Plan. It prepares you to take the examination of the American Registry of Inhalation Therapists and forms a basis for continuation of study on the baccalaureate degree level. Mathematics and the physical, biological, medical, and health sciences provide the basis for the professional instruction in Respiratory Therapy. In addition you will study English, speech, psychology, and history to provide you with the necessary general educational background. You may round out your program with elective courses.

Your Future

Graduates of associate degree programs find themselves in demand for hospitals all over the country. Those who pass the examination of the American Registry of Inhalation Therapists are sought for leadership positions in hospitals, educational programs, and research facilities. As the incidence of respiratory disease continues to rise in this country and the world, the demand for qualified therapists will continue to rise.

Sample Freshman-Year Program of Studies in Respiratory Therapy

<i>First Quarter</i>	<i>Second Quarter</i>	<i>Third Quarter</i>
18.114 Functional Human Anatomy I	18.115 Functional Human Anatomy II	18.120 Basic Microbiology
30.113 Freshman Writing	30.114 Intro. to Literature	86.102 Hospital Law & Ethics
10.104 Fundamentals of Math.	10.105 Fundamentals of Math.	86.193 Mechanical Basis of Respiratory Therapeutics
86.191 Physical Basis of Respiratory Dynamics I	86.192 Phy. Basis of Res. Dynamics II	Soc. Sci. Elective





The Reserve Officers' Training Corps

The Reserve Officers' Training Corps (ROTC) of the United States Army exists for the purpose of developing officers—leaders of men. As a part of the University curriculum, it offers courses of instruction leading to a commission as a Second Lieutenant in the United States Army Reserve or the Regular Army and permits fulfillment of one's military obligation as an officer. The leadership and management benefits which accrue are as important to the individual who intends to make his place in industry as to the man who desires a military career.

Aims

Northeastern's ROTC is an Army, Senior Division, Class CC (Civilian College) unit offering instruction in military fundamentals common to all branches of the United States Army.

Record of Accomplishment

Northeastern has every right to be proud of its ROTC. With an enrollment of approximately 400, the Northeastern Cadet Corps is one of the largest single-campus voluntary units in the United States.

Who is Eligible?

Enrollment in ROTC is entirely voluntary and is open to all male undergraduate students of the Colleges who are physically qualified and can qualify for appointment as Second Lieutenants prior to reaching 28 years

of age. Students may withdraw from ROTC at any time during the freshman or sophomore years.

Instruction

The Department of Military Science is the department of the University which administers the ROTC Program and conducts all military instruction. It is made up of a group of U.S. Army officers and noncommissioned officers especially selected for experience and ability and assigned to Northeastern University by the Department of the Army after acceptance by the University.

Basic and Advanced Courses

ROTC is divided into a Basic Course, during which you may be appointed a cadet noncommissioned officer, and an Advanced Course, in which you may be appointed a cadet officer. The University physical education requirement is satisfied by completion of the Basic Course, which extends over the freshman and sophomore years. The freshman portion of the course is offered at the Burlington Campus, as well as at the Main Campus.

The Advanced Course starts with the middler (third) year and continues through the junior and senior years. Advanced Course students attend a six-week summer camp after the senior year and receive retainer pay while enrolled in the program. The Basic Course or its equivalent is a prerequisite to enrollment in the Advanced Course. Some of the Basic Colleges permit work in the Advanced Course to be substituted for certain electives in earning credit for graduation.

Your Program of Study

Some people think of the ROTC as mostly drill, but you will find that this is not true. About 75 percent of your study will be classroom instruction. The first and second years include Map Reading, Small Unit Tactics, Individual Weapons and Marksmanship, and Leadership Laboratory. The Advanced Course includes such subjects as Tactics and Operations, Military Leadership, Military Teaching Methods, Military Management, Logistics, Military Law, and Counterinsurgency Operations.

Deferment from Selective Service

If you are enrolled in ROTC, and remain in good standing, *you will be granted deferment from Selective Service until your undergraduate education is completed.*

Uniforms and Equipment

The government will provide you with all required textbooks and uniforms without cost. A \$10 deposit is required at the time of enrollment. This will be refunded when you return your uniform and other property to the University in good condition.

ROTC Pay

Advanced Course cadets receive a retainer of \$100.00 per month during actual Advanced Course instruction. *The total amount of retainer during the three years is \$2,000.00.*

In addition, Advanced Summer Camp pay is approximately \$400.00 over and above food, quarters, and medical care, which are free. Transportation to and from camp is paid at the rate of six cents per mile.

ROTC Scholarship Programs

The Army ROTC Scholarship Program is designed to offer financial assistance to outstanding young men who are interested in the Army as a career. Each scholarship provides for free tuition, textbooks, and laboratory fees in addition to paying a retainer of \$100.00 per month for the period that the scholarship is in effect. The scholarships are provided under the provisions of Public Law 88-647, The ROTC Vitalization Act of 1964.

Scholarships may be awarded for either one, three, four, or five years. Five-year scholarships are open to all students entering Army ROTC as freshmen, while the other scholarships are restricted to those students who have completed the varying degrees of ROTC and are selected for continued enrollment. Applications for five-year scholarships must be submitted early in January of the student's senior year of high school.

Distinguished Military Students

If you demonstrate outstanding qualities of leadership, high moral character and a definite aptitude for military service, and have attained an academic standing in the upper half of your class, you may be designated a Distinguished Military Student. This honor, conferred during the junior year, is the highest to be given to any ROTC cadet.

If you maintain creditable standing up to graduation, you will be designated as a Distinguished Military Graduate. This designation will appear in the commencement program as a military honor similar to the regular academic honors. Distinguished Military Graduates are normally offered a commission in the Regular Army, which they may accept instead of a Reserve commission.

Flight Training

Northeastern was one of the original group of universities and colleges in the United States at which the Army ROTC Flight Training Program was introduced in 1956.

Under this Program, the Army will pay for flight training for selected qualified ROTC cadets. This program is offered during the senior year. To participate, the student must have an aptitude for flying and meet required physical standards. He must also agree to participate in the Army Aviation Program, if selected, after entering active service.

Flight training under the ROTC Program is given at an airfield near the University by a civilian flying school which has been approved by the

Federal Aviation Agency, Department of the Army, and the University. The instruction includes 35 hours of ground training and more than 36 hours of flight training. It is taken on an extracurricular basis. All textbooks, flight clothing, and equipment required are furnished with no cost to the student.

Students who successfully complete the instruction may qualify to take the FAA examination for a private pilot's license.

ROTC Activities

Cadets are eligible for selection to membership in the honorary military societies: the Pershing Rifles, Scabbard and Blade, and the National ROTC Band Association.

In addition, they may participate in the University ROTC Band, the University Rifle Club (Varsity, Freshman, and ROTC Rifle Teams), the Counter-Guerrilla Group, and student chapters of professional societies such as the Armed Forces Communications and Electronics Association, and the Society of American Military Engineers.

The Annual Military Ball, sponsored by the Scabbard and Blade, is one of the most outstanding and colorful events of the year, with the queen and her court ruling over the festivities.

part 3

The Particulars of Education

The Particulars of Education

THE DEPARTMENT OF ADMISSIONS

To find a college or university where both success and happiness can be achieved is a goal of every young adult who plans to continue his education beyond secondary school. This can be realized in a number of ways—by talking with enrolled students and alumni, and by reading catalogs. High on the list of priorities should be a visit to the college campus. The Committee on Admissions at Northeastern University extends a cordial welcome to all students and has planned a series of experiences to make their visit as worthwhile as possible.

The Admissions Conference

It is only natural that students should have many questions about Northeastern—its programs of study, its services to students, and the Cooperative Plan of Education in which so many of its upperclassmen are involved. For this reason, the Committee on Admissions sponsors a series of Orientation Conferences for the benefit of students. Offered at 10:00 a.m. and 2:00 p.m. on Mondays and Fridays during the period September 1 through April 30 (except for legal holidays), these conferences have been most successful in helping students to understand the University better. They include a sound filmstrip in color and appropriate comments by an admissions counselor. This is followed by an informal question and answer period.

Special group sessions are also held in the summer between July 1 and September 1. Further information about these summer conferences may be obtained from the Admissions Department.

Guided Tours

Guided tours of the campus are held daily, Monday through Friday, at 11:00 a.m. and 3:00 p.m. Both the admissions conference and the tour should be scheduled in advance. The opportunity to visit the University's facilities and to observe student life on campus is one important way to learn about Northeastern. Commuting students who wish to visit the University's Suburban Campus in Burlington are encouraged to do so. This will appeal especially to those whose home communities are on the North Shore of Boston.

The Interview

The interview is generally regarded as an appropriate time for students with special problems to meet personally with an admissions counselor. In studying the secondary school record, the counselor may discover some factor which merits further explanation. In this event, the applicant may be asked to arrange a visit to the Admissions Office. The interview, therefore, may be held at the request of the student or the counselor. Ordinarily, contacts with Admissions personnel will be more beneficial if the two publications *Introducing Northeastern University* and *Co-opportunities* have been carefully studied before the visit to campus.

Special Note

Northeastern does not hold classes for students in the Basic Colleges on Saturdays; hence, guided tours cannot be provided at that time. A weekday visit to the University is strongly recommended. Special Saturday appointments are arranged on a limited basis, however.

GENERAL REQUIREMENTS FOR ENTRANCE

The Northeastern University Committee on Admissions believes that candidates should complete a secondary school program which is as challenging as the student's ability enables him to complete successfully. A recommended program should include courses in English, foreign language, mathematics, laboratory science, and history. Of particular importance are the total quality of the school record, continuity and proficiency in subjects which are critical to one's area of study at the University, and a wise choice of elective courses. The high school transcript should provide clear evidence of sound study habits so necessary to success in college study.

All candidates are encouraged to broaden their reading outside of class. It has been said that books stretch the mind. The student who can communicate ideas, understand word meanings, and write effectively is at a distinct advantage in the competition for admission.

Someday the period of the 1970s will be recorded as a time of great

change in the calendars and programs of both secondary schools and colleges. At the high school level such innovations as independent study, seminars for upper-level students, research projects, and active participation in worthwhile community projects have become the rule rather than the exception. Many of these opportunities have come into being as the result of open-campus developments.

Northeastern University is understandably interested in the growth of the work/study concept in many secondary schools. Its Committee on Admissions looks with favor upon the variety of worthwhile experiences outside the classroom walls, from which so many students are profiting.

In similar vein, the University has introduced a degree of flexibility into its programs which makes it possible for enrolled students to explore a variety of academic areas. For example, through the preregistration system in the College of Liberal Arts, candidates for admission may delay definite educational choices until after the fact of acceptance. Northeastern's concern is that students not be forced into making educational and career decisions before their experience can make such decisions possible.

Preparation for Study in Languages

If you hope to enroll in the College of Liberal Arts, or if you intend to elect a language while enrolled in the College of Education or the College of Pharmacy and Allied Health Professions, you must have demonstrated proficiency in a foreign language. The Committee on Admissions believes that a background of foreign language study is desirable for all students whatever their career interests.

Preparation for Study in Engineering, The Sciences, and Mathematics

It is only natural that evidence of special aptitude and the highest possible level of preparation in science and mathematics should be required of those who wish to study in the College of Engineering, or who wish to major in Mathematics, Chemistry, Biology, or Physics in the College of Liberal Arts. Such preparation is also required of those who wish to prepare for the Teaching of Mathematics/Science while enrolled in the College of Education. Demonstrated technical aptitude is of paramount importance for those who seek admission to the Bachelor of Engineering Technology Program as offered by Lincoln College.

The Committee on Admissions requires demonstrated ability in science and mathematics in all the following areas of study:

Boston-Bouvé College

Health Education
Physical Education
Physical Therapy

College of Education

The Teaching of Science-
Mathematics in junior and
senior high schools

College of Engineering

All programs

College of Liberal Arts

Biology, Chemistry, Geology,
Mathematics, Physics

College of Nursing

A.S. Degree program
B.S. Degree program

*College of Pharmacy and
Allied Health Professions*

All programs

Lincoln College

B.E.T. Degree program

It is recognized that courses in science and mathematics vary to a large extent in terminology, teaching methods, and in content. Applicants are encouraged, however, to complete the full sequence of such courses if possible. Admissions counselors may recommend or require additional summer school study prior to enrollment if an examination of the school record reveals a deficiency in preparation. Despite the emphasis upon mathematics and science in these programs, study in the social sciences and humanities is considered an important foundation for subsequent professional courses.

Preparation for Study in Business and Management

Candidates for admission must have successfully completed a strong college preparatory program in high school. A primary goal of this curriculum is to provide a broad preparation for leadership in administration. While mathematics plays an important role in the total program, strong emphasis is also placed upon study in the liberal arts. Through the behavioral sciences, students are afforded opportunity to develop skills in the management of people.

**Preparation for Study in the Social Sciences,
Teaching, and Law Enforcement**

Many candidates for admission have enjoyed their greatest success in areas other than mathematics-science. Their interests lie quite naturally in the study of the humanities and social sciences. If you are such a student, you may choose to apply for admission to one of the following programs:

Boston-Bouvé College

Recreation Education

The major in Recreation Education is developed from a broad liberal arts foundation. Students may select an emphasis in Community Recreation, Outdoor Education and Conservation, or Therapeutic Recreation for work with the retarded, the handicapped, or the aging.

College of Criminal Justice

By its very nature, the program in law enforcement requires a strong base of liberal arts study before professional courses are introduced. Applicants for admission should therefore demonstrate an ability to succeed in their study of the behavioral and social sciences.

College of Education

Professional courses leading to teacher certification are based upon a strong foundation of liberal arts study in the humanities and social sciences. Included in this area are programs in Elementary Education, Special Education, and the Teaching of English, Languages, and Social Studies.

College of Liberal Arts

Broad and flexible programs are offered to meet a variety of student interests in Art History, Drama, English, History, Journalism, Modern Languages, Music, Philosophy, and the Social Sciences. A wide selection of elective courses enables students to broaden their horizons in many areas of study.

APPLYING FOR ADMISSION

An Application for Admission is included in the back of this catalog. The application should be filled out properly in ink, signed, and forwarded to the Dean of Admissions, Northeastern University, Boston, Massachusetts 02115. Checks should be made payable to Northeastern University. It is to the student's advantage to submit his application for admission promptly.

Rolling Admission Plan

Under Northeastern's Rolling Admission Plan, candidates may be notified of their acceptance at that point in their secondary school careers when there is sufficient evidence that they will be able to profit from study at the university level. This may occur early in the senior year or after the results of College Board Examinations have been evaluated. In all cases of early acceptance, candidates are required to complete successfully the senior year of high school.

Early Admission

In certain cases, highly talented students who have studied in an enrichment program of studies may enroll at Northeastern prior to high school

graduation. A special form provided by the Admissions Committee requires the endorsement of the school principal or guidance counselor for early admission.

Advanced Placement

The University grants advanced placement credit to those students with a score of 3 or better in their Advanced Placement Examinations. Such students are excused from the basic courses in English, History, Chemistry, Mathematics, Biology, and Physics and in the advanced courses in languages to which the Examinations apply. They receive full credit for those courses from which they are excused.

Applicants are required to write their Advanced Placement Tests of the College Board in May.

College Level Examination Program

The University cooperates with the College Entrance Examination Board in its CLEP Program. Qualified students are encouraged to write the general and/or subject matter examinations of CLEP, with the result that college credit may be allowed upon entrance. In general, the Committee on Admissions accepts the score range recommendations of the College Board. Northeastern University has been designated a CLEP Testing Center. Inquiries may be addressed to Room 302 of the Carl S. Ell Student Center Building.

Entrance Examinations

The results of entrance examinations are regarded by the Committee on Admissions as a useful guidance tool. It is the quality and scope of a student's school record which is of primary importance, yet the results of aptitude and achievement tests are helpful to the admissions counselor in determining that field of study in which he is most likely to succeed. Secondary schools normally forward to the Department of Admissions the results of many test batteries which were administered during grades 9 through 12. It is the consistency of these score ranges which is significant. All candidates are required to complete the Scholastic Aptitude Test and three Achievement Tests of the College Entrance Examination Board. There is no single schedule of testing which is best for all students. As a basic rule, no achievement test should be attempted unless the particular subject is currently being studied. Students are advised to consult their guidance counselors for appropriate testing schedules.

All students are required to write the English Composition Achievement Test. Two other Achievement Tests are also required. In general, it is expected that applicants will complete this testing requirement in the areas in which they feel most competent. It is recognized that the senior program of studies may determine the individual student's choice of Achievement Tests.

For full information about College Board Examinations, consult your school guidance office or write directly to:

*The College Entrance Examination Board
Post Office Box 592
Princeton, New Jersey 08540
or
Post Office Box 1025
Berkeley, California 94701*

Programs For Minority Group Students

Northeastern University deliberately seeks to expand educational opportunities for deserving minority group students and to recruit promising students from economically and culturally disadvantaged backgrounds. In so doing, it has increased its guidance and other supporting services in order that such students may be assured the opportunity to succeed in their chosen fields of study. These supporting services include tutorial study, programmed instruction, and summer study prior to enrollment. Other counseling services are provided by the University's Afro-American Center. Financial aid is granted as may be required to make college attendance possible.

General and Special Health Requirements

The general health of all applicants for admission must be satisfactory. Prior to registration at Northeastern, each applicant must submit on a Student Health Service Form supplied by the University evidence of a complete physical examination and chest X-ray. This information must be forwarded to the University physician for his review. Proper health clearance is considered a condition of admission.

Because of the special nature of certain professions which stress bodily coordination, physical skills, rehabilitation, and patient care, emphasis is necessarily placed upon sound health. For this reason, those who seek admission to the Boston-Bouv  College or the College of Nursing are required to receive special health clearance prior to enrollment.

Transfer with Advanced Standing

Each year a number of qualified applicants are admitted as transfer students from other colleges and universities. In order to enter with advanced standing, a student must have completed the full equivalent of the freshman year at Northeastern with grades of "C" or better. Full information about transferring with or without transfer credit is available upon request.

Required Deposits

If the Committee on Admissions makes a favorable decision on your application, you will be asked to submit a nonreturnable tuition deposit of

\$100 by April 1. This deposit serves as an indication of your intention to enroll and is applied to your first-quarter tuition account. A dormitory deposit of \$100 is due at the same time for resident students. Requests to extend the deposit date to May 1 will be honored if they are submitted, in writing, to the Committee on Admissions no later than March 15.

Deferred Admission

Increasing numbers of accepted students seek information about a deferred admission policy. Those who seek a travel experience before entering college, and those who prefer to improve their financial resources through gainful employment rather than to begin college studies in the fall, will find that the following options are open to them.

1. The University now enrolls a January freshman class in most of its programs. January admission opens up travel and work opportunities through the month of December. Further information about the January class is available upon request.
2. Accepted students who do not submit the required tuition deposit on April 1 will be placed on an inactive roster. Those students who wish to enroll a year later should communicate with the Admissions Office no later than February 1, describing the activities in which they have been involved. Normally, a new certificate of admission would be issued to them at that time.

EXPENSES

In considering the cost of a college education, it is well to remember that the expenses involved are an investment—an investment you and your family are making in your future. It is perhaps the most significant investment you will make in a lifetime.

It is important for you to understand that the freshman year at Northeastern University is one of three quarters of full-time study. The Cooperative Plan of Education, under which Northeastern students are gainfully employed for services rendered, begins in the sophomore year.

In addition to serving its primary purpose of providing invaluable on-the-job training, the Cooperative Plan also makes possible an education without the accumulation of large personal debt.

Because of this Cooperative Plan of Education and Northeastern's determination to keep the basic expenses as low as possible, many worthy students who otherwise might not have been able to afford an education have attended Northeastern. This is why Dr. Wilson M. Compton, former President of the Council for Financial Aid to Education, has complimented Northeastern for "... opening college opportunity for thousands to whom the doors heretofore have largely been closed."

Freshman Expenses (3 Quarters)

Tuition for the freshman year is \$1,815, payable in three installments as follows:

September 20, 1973	*\$605.00
January 2, 1974	\$605.00
April 1, 1974	\$605.00

For students residing away from home, living expenses for Orientation Week and the three-quarter freshman year will vary slightly according to dormitory accommodations. These are on a seven-day-a-week basis.†

Speare and Stetson Halls	\$500.00 a quarter
Light, Melvin, Smith, and White Halls	\$485.00 a quarter
Other dormitories	\$460.00 a quarter

In addition, students who live in University residences are required to pay an infirmary fee of \$15 per quarter. Payment is due on the dates appearing in the tuition schedule above.

Summary of Freshman Expenses

Your expenses for the three quarters of the freshman year will be distributed somewhat in this manner:

Application fee	\$15
Tuition	\$1815
ROTC deposit (if applicable)	\$10
Books and supplies	\$80-120
Health Services fee	\$75
Personal expenses	\$250-350
Board and room (if applicable)	\$1380-1500
Infirmary fee (if applicable)	\$45
Student Center fee	\$37.50
(\$12.50 for each of the three quarters)	

Boston-Bouvé College Professional Programs—Approximate Costs

Physical Education	
Required uniform	\$85
Spring Practicum at Warren Center	\$70
Physical Therapy	
Required uniform for physical therapy procedures and physical education, with clinic uniform costs in upper-class years	\$20
Recreation Education	
Required uniform	\$50
Summer Camp	\$170 (approx.)

*Less the nonrefundable \$100 tuition deposit payable on or before April 1.

†A nonrefundable deposit of \$100 for board and room is payable not later than April 1. This deposit, which is applied to the first-quarter cost of residence, reserves a space for you in a University dormitory. Notices of definite room assignments are mailed by the Director of Housing in the summer.

Health Education

Required uniform for physical education \$25

Because certain courses involve the use of consumable materials and the hazard of breakage, separate deposit fees of \$5–\$20 may be charged.

All rates and fees are subject to revision by the Board of Trustees at any time.

Between the freshman and the sophomore years, you will have a vacation period of 13 weeks. Generally, Northeastern students use this period to earn money toward tuition costs.

Upper-Class Tuition

For the academic year 1972–1973 the tuition rates for upper-class students have been established as follows:

Engineering	\$1720	(\$860 per quarter)
All Other Colleges	\$1670	(\$835 per quarter)

Upper-Class Earnings

The average Northeastern student in good standing earns from \$1,800 to \$3,300, depending upon his year and major, during *each* of his four upper-class years on co-op. Some students will earn much more than this. In addition, men electing Advanced ROTC will receive income amounting to approximate \$2,000 during their final three years.

Most students residing at home and some resident students living in college dormitories can expect to earn enough money to cover the cost of tuition, books, and incidentals.

Upper-class students whose co-op assignments take them some distance from the Boston area will incur additional expenses which may not be completely offset by their additional earnings. Such factors are considered by the Director of Financial Aid when making scholarships and loans available.

Payment of Tuition

All payments should be made at the Bursar's Office, which is located on the second floor of Richards Hall. Checks should be made payable to Northeastern University.

A fee of \$10 will be charged for failure to make payment, or specific arrangements for payment, on or before the date due.

A student is eligible to attend classes only if:

1. Tuition for a given term is paid by the beginning of the second week of that term; or
2. Specific arrangements have been made with the Bursar for a plan of deferred payment, which entails a fee of \$2.

Accident and Sickness Insurance

Students registered in the Basic Colleges are granted a special Blue

Cross-Blue Shield Hospital Policy which remains in effect continuously from the day of initial registration until the day following withdrawal, dismissal, or graduation from the University.

All students pay a nonrefundable University Health Services fee of \$75 per year. This fee covers the group Blue Cross-Blue Shield program and the medical services which are provided to students by the University Health Service.

Late Registration Fee

A fee of \$5 will be charged for failure to register in accordance with prescribed regulations on the dates specified in the college registration bulletins. Registration must be made in person.

ROTC Uniform Deposit

Freshmen enrolling in ROTC make a deposit of \$10 to cover loss of, or damage to, an ROTC uniform or equipment. Any loss or damage exceeding the deposit will be charged to the student.

Non-Cooperative Plan

Certain students in the College of Liberal Arts may elect non-cooperative programs. Tuition rates per quarter are the same as for students on the Cooperative Plan, and payments are due on the same dates.

Refunds

The University provides all instruction and accommodations on an academic-term basis; therefore, no refunds are granted except in cases where students are compelled to withdraw on account of personal illness or for other reasons beyond their control.

FINANCIAL AID

In the process of selecting a college or university, the element of cost can be an important factor. To make attendance at Northeastern feasible for qualified students regardless of their financial circumstances, the University operates a substantial financial aid program. Coordinating the resources of the University and the various public and private scholarship and loan programs, the Office of Financial Aid oversees programs which provided over five million dollars to almost 5,000 students in 1971-1972.

Types of Financial Aid

Financial aid at Northeastern may consist of a scholarship, loan, part-time employment, or any combination of these three, as determined by the Office of Financial Aid. This "package plan" helps an increasingly larger number of students and families meet their educational expenses. The type and amount of aid awarded will depend on the applicant's achievement in the secondary school, participation in school and community activities, and the financial need of the family.

The University does not award financial assistance in any form to foreign students.

College Scholarship Service

Northeastern University participates in the College Scholarship Service (CSS) of the College Entrance Examination Board. Participants in CSS subscribe to the principle that the amount of financial aid granted a student should be based upon financial need. The CSS assists the college and university and any other agency in determining the student's need for financial assistance.

Application Procedure

Applicants seeking financial assistance for the freshman year are required to submit a copy of the Parents' Confidential Statement (PCS) to the College Scholarship Service by January 15, designating Northeastern University as one of the recipients. The PCS may be obtained from secondary school guidance offices. If the form is not available at a student's high school, he should communicate with the Office of Financial Aid.

By filing the Parents' Confidential Statement, a student will automatically be considered for all pertinent aid programs. It is not necessary for him to apply for aid programs on an individual basis.

Students should remember that the earlier they have completed their financial aid application and have been accepted for admission to Northeastern, the better are their chances of receiving aid.

The Office of Financial Aid encourages students to discuss the cost of their academic program with their families and to make application for assistance if there is a realistic need for it. Many students have the misconception that only the top one or two individuals in their class will qualify for aid, or that the size of their family income will render them ineligible for financial assistance. However, since there are many different sources of financial assistance, each with different requirements for eligibility, it is advisable for a student to make application and then let the University officials decide on his qualifications. By failing to apply, and by failing to do so in sufficient time for the University to take appropriate action, the student may place an unnecessary burden on himself and his family.

SCHOLARSHIP PROGRAMS

Federal Grant Programs

The Educational Opportunity Grant Program is designed to provide aid to exceptionally needy students with academic promise. The grants, ranging from \$200 to \$1,000, must be matched by scholarship or loan awards from other programs and are renewable according to financial need.

The Law Enforcement Grant Program makes available maximum awards of \$600 per year for students enrolled in an area of study directly related to law enforcement. Applicants must be full-time employees of a public

law enforcement agency and must agree to work for this agency for a two-year period following completion of their studies.

The Federal Nursing Scholarship Program provides maximum grants of \$2,000, no matching funds required, to promising, exceptionally needy students enrolled in the College of Nursing.

The Health Professions Scholarship Program provides maximum grants of \$2,000, no matching funds required, to promising, exceptionally needy students enrolled in the College of Pharmacy and Allied Health Professions.

State Scholarship Programs

The Commonwealth of Massachusetts provides scholarship aid to Massachusetts students pursuing full-time day programs of study in an accredited college or university. Awards are made in the summer of each year, and applications for entering freshmen are available in December through their high school guidance office. Out-of-state students should also investigate aid programs in their respective states. Substantial state aid is offered by Connecticut, New Jersey, Pennsylvania, and Rhode Island. The Office of Financial Aid strongly advises aid applicants to apply to state scholarship programs at the same time that they apply for aid from the University.

Trustee Scholarships

Established in 1928 by the Board of Trustees of Northeastern University, these scholarships are granted each year in all of the Basic Colleges to entering freshmen who have demonstrated scholastic attainment throughout their preparatory or high school courses.

Regional Scholarships

A number of Regional Scholarships are available to highly qualified students who reside in rural New England areas.

Charles Hayden Memorial Scholarships

The Charles Hayden Foundation, created by the will of the late Charles Hayden, an alumnus of the Boston English High School, offers annually memorial scholarships to freshmen at Northeastern University. The scholarships are awarded to "deserving boys" whose parents are unable to finance the entire cost of their education.

Alumni Scholarships

Scholarships for entering freshmen in each of the Basic Colleges are awarded annually by the Northeastern Alumni Association through the generosity of donors' gifts to the Alumni Fund. Awards are granted to applicants who are relatives of Northeastern alumni on the basis of academic achievement and financial need.

Community Scholarships

The University has made available a number of \$500 Community Scholarships for qualified entering freshmen who reside in Ashland, Boston, Burlington, and Weston. Full tuition scholarships are also offered to qualified applicants who reside in Framingham, Lynn, and Weymouth.

Nursing Scholarships

Scholarships are made available to students in the College of Nursing through a fund established by contributions from Northeastern University, the Permanent Charities Fund, the Children's Hospital Medical Center, and the Beth Israel, Massachusetts General, New England Deaconess, and Peter Bent Brigham Hospitals.

ROTC Scholarships

The Army Reserve Officers' Training Corps Scholarship Program is designed to offer financial assistance to outstanding young men who are interested in the Army as a career. Each scholarship provides for full tuition, fees, and textbooks in addition to pay of \$100 per month, which during one six-week summer training period is increased to one half of a Second Lieutenant's pay.

ROTC scholarships at Northeastern are for either a five-year or three-year period. They are awarded to selected entering freshmen or students who have completed the first two years of ROTC. Scholarships are not related to financial need, and the earnings of a student during his co-operative work period do not reduce scholarship payments. This award may be supplemented, when necessary, by a scholarship, loan, or part-time job.

Applications for entering freshmen must be submitted prior to March 1 for the following school year. Information on the ROTC Scholarship Program may be obtained by writing to the Professor of Military Science, Northeastern University.

STUDENT LOAN PROGRAMS

National Defense Student Loans

National Defense Student Loans are granted from funds made available jointly through the United States Congress and through the University. Applicants must be United States citizens or permanent residents of this country. Applications for such loans are made on a year-to-year basis, and the amount of each loan will be based on the University's estimate of financial need and the funds available for distribution at the time. No interest is charged on these loans until nine months after graduation, at which time a 3 percent interest rate is applied. The loan is to be repaid in equal installments over a 10-year period after graduation, but may be repaid at any earlier date. A student may cancel a portion of the loan for

full-time employment as a teacher in a public or private and nonprofit elementary or secondary school and institutions of higher learning.

Nursing Student Loans

The Nursing Student Loan Fund is similar to the National Defense Loan Program. A student may cancel a portion of her loan if she accepts full-time employment as a professional nurse in any public or nonprofit institution or agency.

Health Professions Loans

This program provides maximum loan aid of \$2,500 per academic year to College of Pharmacy and Allied Health Professions students who evidence academic promise and financial need.

Loan repayment of principal and interest commences three years after completion of studies and may extend over a 10-year period.

Law Enforcement Loans

The Law Enforcement Loan Program makes available 10-year, 3 percent interest loans up to a maximum of \$1,800 per year to full-time students enrolled in a program directly related to law enforcement. Loans may be cancelled at the rate of 25 percent per year for each year of full-time employment in a state, local, or Federal law enforcement agency.

Northeastern University Student Loans

Northeastern University has established a small tuition loan fund for the benefit of needy students who cannot be assisted through usual aid sources. Terms of repayment are comparable to those of the National Defense Loans.

Guaranteed Insured Student Loans

Under the Higher Education Act of 1965, students are eligible to borrow from a bank or other participating financial institution a maximum of \$1,500 per academic year for their educational expenses. For students whose adjusted family incomes are less than \$15,000, the interest would be paid by the Federal government. Repayment would begin after graduation. The award is not based on financial need, and it is available to students regardless of their family income. Students should inquire at their local lending institution for application forms and additional information regarding this program.

PART-TIME WORK

While it is unwise for a student to look to part-time employment as the sole means of financing his college education, it is a recognized fact that most students will seek part-time employment sometime during their col-

lege career, generally combining these earnings with some other form of financial aid.

So that employment may be made readily available to all students who need it, the University has created from its own funds and from funds provided under the College Work-Study Title of the Higher Education Act of 1965 a large number of job opportunities both on campus and in the neighboring community. In all cases the jobs are structured in such a way as to provide maximum part-time earnings without interfering with a student's prime study time. In many cases the University is able to provide summer employment for local students prior to their enrollment in September.

Any student wishing to secure part-time employment must file a copy of the Parents' Confidential Statement with the Office of Financial Aid and then communicate with that Office directly after official acceptance for admission.

HOUSING

Women's Residence Regulations

Unmarried women students who are under age 21 in their first year of college, and who do not live with their parents or a legal guardian, are required to live in a University residence hall both while attending classes and working on their cooperative assignment. If a student's cooperative work is not in her home town, and if it is not within commuting distance of a University residence hall, special housing arrangements are made through the Department of Cooperative Education, with the written approval of her parents. Commuting students who wish to live elsewhere than at home are also subject to the University's resident requirements.

Certain exceptions to these rules are made for students who desire to live in another form of supervised housing approved by the University, or who desire to live with an older relative, such as a grandparent, aunt, or uncle. Permission for such a living arrangement must be obtained in advance from the Office of the Associate Dean of Students for Women's Affairs. Special request forms for this purpose are available in that Office, and must be submitted at least two weeks before the beginning of the quarter in which the housing change would take effect. However, a request for special residence permission does not mean that a student may ask to be simply excused from the University's residence requirement.

Students in unauthorized housing are subject to disciplinary action. Questions regarding these regulations must be directed to the Associate Dean of Students for Women's Affairs.

STUDENT ACTIVITIES

Whether your hobby is painting, science, photography, chess, debating, sports, writing, music, dramatics, or international relations, chances are

you will find numerous opportunities to continue your interest while at Northeastern.

More than 130 varieties of student activity are conducted regularly. These include clubs, fraternities, sororities, religious groups, honor societies, musical organizations, societies for women students, professional societies, and student government groups. Most of these activities are open to freshmen.

The hours from 12:00 noon to 2:00 p.m. on Tuesdays and Thursdays are reserved exclusively for student activities. No classes are scheduled during this period.

If you like politics, you may wish to run for office. Each class has its own set of officers, and the campaigning for "jobs" on the class boards is frequently as spirited as that in any state or national election.

We hope—and believe—that you will enjoy as least some of these activities and special events. The only limitation is that imposed by time required for the proper amount of study. If your marks are low or if you are doing work far below your capabilities, your participation in student activities should be limited until you are in good academic standing.

Participation in extracurricular activities will help you to live a full life at Northeastern University. Not only will sharing in these activities contribute to your further growth and self-development through training and experience gained, but it will provide much beneficial recreation with new-found friends and an opportunity to serve Northeastern. If you become a leader in one of the organizations that particularly interests you, you will be taking advantage of the opportunity to develop real administrative and executive ability.

The importance which Northeastern places on student activities is not only shown by the regular hours set aside for participation, but also by the extension of the advisory system to the program. Many organizations have their own faculty adviser, who takes as much interest in the progress of student members as does their section or class adviser and their coordinator in the Department of Cooperative Education. The faculty adviser will give students the benefit of his or her experience and mature viewpoint in integrating their activities with other important phases of college life.

Chapel Services

Chapel services are held in the Bacon Memorial Chapel, located in the Carl S. Ell Student Center, on Thursday from 12:30 to 1:00 p.m. Eminent clergymen speak at the interfaith services. Attendance is voluntary.

The Dean of Chapel, who is available daily for counseling, and the Director of Chapel Music assist the Student Chapel Committee of the Student Union in planning the services.

Special Interest Groups

All-University Activities

Distinguished Speakers Series	Student Center Committee
Husky Key	Student Council
Radio Station WRBB-FM	Student Union

Artistic Organizations

Art Club	Dance Theatre	Silver Masque
----------	---------------	---------------

Educational Organizations

American Students for Israel	International Students' Forum
Computer Club	Medical Technology Club
Debate Council	Music Therapy Club, Recreation
Economics Society	Education Department
German Club	Objectivism Study Group
Health Education Majors' Club	The Philosophy Forum
History Club	Physical Education Majors' Club
	Physical Therapy Club

Musical Organizations

Chamber Orchestra	N. U. Band
Early Music Players	N. U. Chorus
Ethnomusicological Society	ROTC Band

Political and Social Action Organizations

Chinese Students' Club	Students for a Democratic Society
Contact Phone	University Forum
Ecology Coalition	Vietnam Veterans Against the War
N. U. Female Liberation	Young Americans for Freedom
Progressive Labor Party	Young Democrats

Publications

Cauldron	Northeastern News	Spectrum
----------	-------------------	----------

Recreational Organizations

Camera Club	Sport Parachute Club
Chess Club	Sports Car Club
Film-making Club	Underwater Society
Hus-Skiers and Outing Club	Table Tennis Club
Karate Club	Women's Athletic and Recreational
Model Railroad Club	Association
Radio Club	Wrestling Club
Rifle Club	Yacht Club

Religious Organizations

Baptist Fellowship	InterVarsity Christian Fellowship
Canterbury Club	Lutheran Club
Catholic Students Association	Nichiren Shoshu of America
Christian Prayer Group	N.U. Overcomers
The Christian Science Organization	Phanar (Greek Orthodox)
Congregational Club	Presbyterian Club
Hillel Counselorship	Unitarian Universalist Club
	Wesley Club (Methodist)

Fraternities

The 15 recognized fraternities at Northeastern (six local and nine national) play an important part in the life of the University. Membership is by invitation, and bids are extended by the fraternity to freshmen during their first and second quarter. Smokers, dances, and socials for freshmen are held with the object of pledging. The fraternities are:

Alpha Epsilon Pi (national)—Brookline
Alpha Kappa Sigma—Jamaica Plain
Beta Gamma Epsilon—Boston
Delta Chi (national)—Jamaica Plain
Delta Sigma Theta (national)—Boston
Gamma Phi Kappa—Boston
Nu Epsilon Zeta—Brookline
Phi Beta Alpha—Boston
Phi Gamma Pi—Brookline
Phi Kappa Tau (national)—Jamaica Plain
Phi Sigma Kappa (national)—Jamaica Plain
Rho Pi Phi (national)—Boston
Sigma Alpha Mu (national)—Boston
Tau Kappa Epsilon (national)—Allston
Zeta Beta Tau (national)—Jamaica Plain

The Interfraternity Council coordinates activities of these groups.

Honor Societies

The several honor societies are made up of juniors and seniors who have been elected to membership from a list of eligible students submitted by the faculty. The basis of membership is high scholarship, good character, and outstanding personal qualities. By meetings and annual scholarship awards, the societies cultivate interest in and attainment of high academic accomplishment.

All Colleges of University
Phi Kappa Phi
Boston-Bouvé College
Boston-Bouvé Honor Society

College of Business Administration
 Beta Alpha Psi (Accounting)
 Beta Gamma Sigma
 College of Education
 Kappa Delta Pi
 College of Engineering
 Alpha Pi Mu (Industrial)
 Chi Epsilon (Civil)
 Eta Kappa Nu (Electrical)
 Omega Chi Epsilon (Chemical)
 Pi Tau Sigma (Mechanical)
 Tau Beta Pi
 College of Liberal Arts
 The Academy
 Alpha Kappa Delta (Sociology)
 Phi Alpha Theta (History)
 Phi Sigma (Biology)
 Pi Sigma Alpha (Political Science)
 College of Pharmacy
 Rho Chi

Organizations for Women Students

All women students are eligible to join the women's society, Omega Sigma. Through meetings and social functions, this society works to promote greater friendliness and unity among women students.

SORORITIES

Alpha Sigma Tau (national)	Delta Phi Epsilon (national)
Alpha Omicron Pi (national)	Lambda Delta Phi (national)

SPECIAL INTEREST GROUPS

Cheerleaders	Modern Dance Group
Dance Theatre (open to men and women)	

Intramural Sports

MEN'S INTRAMURAL SPORTS

The intramural sports programs for men are organized to permit students to participate as members of a sports club, as members of a team, or as individuals on a nonteam, "drop-in-and-participate" basis. Sports activities are scheduled according to seasonal interests, and include aquatics, badminton, basketball, boxing, gymnastics, handball, jogging, judo, track, volleyball, and weight and training.

WOMEN'S INTRAMURAL SPORTS

The Women's Athletic and Recreation Association has, as its prime purpose, the promotion of activity opportunities of an athletic and recreational nature for all undergraduate women students. Throughout the year, intramurals and club participation are possible in badminton, basketball, fencing, field hockey, golf, gymnastics, lacrosse, modern dance, speed swimming, synchronized swimming, tennis, and volleyball. Varsity athletic teams for women include basketball, fencing, field hockey, lacrosse, swimming, diving, tennis, and volleyball. Other activities may be offered when warranted by student interest and availability of facilities.

Professional Societies

You will benefit in many ways by joining the student chapter of a professional society in an area of study of particular interest to you. You will keep up with latest developments by listening to authorities in that field; you will have the opportunity to exchange ideas with students from other colleges and universities as well as from Northeastern; and you will learn more about professional standards.

If you take an active part by attending regular meetings and social affairs, you may become an officer or a representative or member of a delegation to meetings outside the University. Such participation may prove invaluable in shaping your career.

The following professional societies are open to upperclassmen in their respective professional fields. The majority are national organizations.

- Accounting Society (local)
- Advertising Club (local)
- Alpha Zeta Omega (Pharmacy)
- American Association for Health, Physical Education and Recreation
- American Chemical Society
- American Finance Association
- American Institute of Chemical Engineers
- American Institute of Industrial Engineers
- American Institute of Physics
- American Marketing Association
- American Pharmaceutical Association
- American Physical Therapy Association
- American Society for Medical Technology
- American Society of Civil Engineers
- American Society of Mechanical Engineers
- Armed Forces Communications and Electronics Association
- Association of Schools of Allied Health
- Boston Society of Civil Engineers
- Council of Professional Engineering Societies
- Delta Sigma Theta (Pharmacy)
- Institute of Electrical and Electronic Engineers
- Kappa Psi (Pharmacy)

Lambda Kappa Sigma (Pharmacy sorority)
National Education Association
Rho Pi Phi
Sigma Delta Chi (Journalism)
Society for the Advancement of Management
Society of American Military Engineers
Society of Women Engineers

THE DEPARTMENT OF ATHLETICS

All students are urged to participate in the University's athletic program, which includes all the major collegiate sports.

The University maintains varsity and freshman teams in baseball, crew, cross country, football, hockey, track, and skiing. These teams are among the finest in the East and have represented the University in both national and international competitions. Students also participate in sports such as golf, riflery, and sailing.

Home for the entire athletic program is the spacious Cabot Physical Education Center and Edward S. Parsons Field. The gymnasium has four basketball courts for men and one for women, and also features a rifle range and a cage which provide facilities for indoor track, as well as for cross country, baseball, and football drills. Parsons Field houses the Huskies' football stadium and the Northeastern baseball diamond. It also accommodates training areas for the outdoor track team.

The University's major athletic teams have won 613 varsity events while losing only 353 over the past nine years. Not only has success been a tradition at Northeastern, but balance as well. Of the 65 major teams competing over the past nine years, 52 have had winning seasons while only 10 have been in the red column.

Northeastern annually fields one of the toughest football elevens in New England. In the past 10 years they have enjoyed seven winning seasons against such Eastern powers as Temple, Harvard, and Holy Cross. The finest team in the past decade was 1963's undefeated team that went on to play in the Eastern Bowl.

The Husky hockey forces are one of the most powerful in Eastern ice circles. They won the Eastern Collegiate Athletic Conference Holiday Hockey Tournament in 1964 and have competed in several E.C.A.C. Championships.

Basketball teams at Northeastern also have the winning habit. The Huskies won the N.C.A.A. Regional Championship in 1962 and 1963 and went on to compete in national small-college championships in Evansville, Indiana. Also in 1963 Northeastern received the E.C.A.C. College Division Trophy for the finest small-college team in the East. After competing in six N.C.A.A. College Division Championships in seven years, the Huskies moved into the University Division and finished the 1970-1971 season with a 17 and 4 record.

The track and cross country teams have been outstandingly successful

in recent years. Cross country teams have a 71 and 18 record over the past nine years, with undefeated seasons in 1963 and 1964.

The indoor track team is 67 and 10 over the nine-year span and undefeated in 1964, 1965, and 1966. The Husky harriers have been dominant outdoors, also compiling a 56 and 5 record. In total, the fleetfooted track men have won 204 events over the last nine seasons while losing only 34.

Northeastern baseball ranks with the best in the East. The Huskies were the New England Champions in 1966 and went on to compete in the College World Series. In 1964 they placed second after a dramatic double-header in Fenway Park, and Coach John Connelly was named New England Coach of the Year.

But the most amazing Husky sports story is that of Northeastern's crew. Their first season in 1965 saw them win four of five regattas while defeating 33 crews and losing to only one during the regular regatta season. Now N.U. is one of the most powerful rowing colleges in the East. The Husky crew received a second invitation to compete in the Henley Regatta, Henley, England, in 1972.

FRESHMAN ORIENTATION PROGRAMS

Except for the visits which we hope you will make to the Admissions Office, your first opportunity to know Northeastern and to meet your classmates, your deans, and your advisers will come during the freshman orientation period.

The program for the orientation period is planned for you and supervised by the Dean of Students and his staff. They will see to it that you are introduced to the customs and people that make up Northeastern. At that time registration, class schedules, and other procedures and details necessary to your enrollment will be completed.

On the first day, in accordance with a long-standing tradition, you will be welcomed by President Knowles at the Freshman Convocation. Later you will be able to meet the Dean of your College and others who will have important roles in your college career.

Upper-class students who volunteer their time will assist in setting up and running programs, primarily evening events, which provide opportunities for relaxation, recreation, and cultural enrichment. The Office of the Dean of Students will be available during the orientation period and throughout the year to answer questions and provide assistance.

THE COUNSELING AND TESTING CENTER

The purpose of the Counseling and Testing Center is to help students with many different concerns. Some deal primarily with educational and vocational planning, and others with personal problems, feelings, and interpersonal relationships. At the Center the student is encouraged to discuss

his concerns with a counselor, following which he might take one or more of these steps:

1. Continue individual discussions with the counselor.
2. Take psychological tests to increase his knowledge of himself.
3. Join a group of students with whom he can share his concerns.
4. Make use of the Center's extensive file of information about careers and services.

The Center's services are available without charge to all students in the Basic Colleges. Students can arrange an appointment by telephoning (617) 437-2142 or by visiting the Center in Room 302 Ell. Vocational counseling services are also available on a fee basis to high school students and adults.

The counseling services of the Counseling and Testing Center are approved by the American Board on Counseling Services.

THE FACULTY ADVISORY SYSTEM

You probably have heard many times that the freshman year at any college is the hardest.

You may have to learn how to study—*really* study—for the first time. You will have to learn to plan your time for study—and stick to it. You will be largely on your own—perhaps for the first time in your life.

This is a large order and undoubtedly will require many adjustments on your part. But the feeling of independence which will come as a result of being on your own will be important to you. Frankly, we think you will find, like many others before you, that this independence—provided that you learn to plan your time wisely—is one of the big thrills of attending college.

But whether you find the adjustment from high school to college life more difficult or easier than most, you can be sure of one thing: you can always rely on a close personal relationship with members of Northeastern's faculty. This is possible through Northeastern's advisory system, which has enabled hundreds of undergraduates throughout the years to make successfully the numerous adjustments to college life. The continuance of the system throughout your four upper-class years will help you to choose a career best suited to your individual talents.

During your first week at Northeastern you will be assigned to a section with 30 to 35 students and will meet your section adviser. You may have this same adviser as one of your classroom teachers throughout your freshman year. He will be informed of the progress you are making in your courses and will be in a position to offer advice and encouragement. Of course, you may consult with the Dean of Students or his assistants at any time. The Dean supervises the entire first-year advisory system.

You will have personal interviews with your section adviser and will also participate in one or two group meetings with all section members on hand. These meetings will really help you to get acquainted and to feel at home.

Soon you will realize another reason why you feel so much at home at

Northeastern. Look around and you will find that members of your section attend many of their classes together. This is a basic and unique feature of the Northeastern freshman year.

Later on, as you get to know your classmates and get into the real swing of college life with all its cultural and social affairs, as well as its studies, you'll find that your class also has a social adviser who serves in that capacity throughout your years at the University.

And in addition to the regular conference hours held by your section adviser, you can feel free to consult with any of your other professors. They have regular conference hours, too, and they spend many additional unscheduled hours in aiding students whenever they need help.

In your upper-class years you will find that your academic adviser will be assigned according to your major instead of by sections.

The deans of the Colleges lend overall direction to these advisers, and they, too, are a basic part of this effective, informal advisory system. You'll find them as friendly, available and willing to help as your section or class advisers.

Foreign Student Information

The University welcomes qualified students from foreign lands who are adequately prepared to benefit from the educational, cultural, and social opportunities it has to offer.

Northeastern University is authorized under Federal law to enroll non-immigrant aliens as full-time students in degree-granting programs of its basic undergraduate colleges and graduate schools. Part-time and special students are not included in this authorization.

Because of special problems of adjustment experienced by many students from foreign countries, the University makes a special effort to examine the educational and financial qualifications of prospective students.

Specific University policies for foreign students are stated in the publication *Information for Foreign Students*. This leaflet may be obtained from the Department of Admissions.





part 4

The Pillars of Education



The Pillars of Education

THE UNIVERSITY LIBRARY

"All that mankind has done, thought, gained or been: it is lying as in magic preservation in the pages of books."

—THOMAS CARLYLE

By the selection of good books you may learn "the very heart and core of ages past, the reason why men lived and worked and died."

As a Northeastern student, you will spend hours of hard, concentrated study in one of the eight large reading rooms in the Dodge Library with space for 675 students.

You may well spend considerable time in the Richardson Room, which, in addition to special equipment, has a collection of 4,000 recordings, and tapes. The records include Shakespearean and other plays, poetry, and prose readings, as well as hundreds of classical and some jazz records. The tapes are made from certain class lectures and can be used as often as needed.

You will also find the Reserve Book Room, the Reference Room, and the Periodical Room (which receives more than 1,700 technical journals and magazines) important to your studies.

An open-stack policy is in force at all times. This means that you will always have free access to all books.

Since it was completed in 1952, the Dodge Library has acquired approximately 310,000 volumes and has a collection that is growing at the

rate of about 3,000 volumes a month. In addition, the Library holds approximately 356,000 titles on microform.

Additional libraries are: the divisional libraries of Physics/Electrical Engineering, Mathematics/Psychology, the Boston-Bouvé College library, the Hurtig Hall library, and the School of Law library. The Suburban Campus at Burlington has its own library, and there are also libraries at the Marine Science Institute in Nahant, and the Center for Management Development in Andover.

We know you will find the library a quiet, convenient place for study or for recreational reading.

LEARNING RESOURCES

The fourth floor of the Dodge Library building is comprised of a variety of specialized resource and study facilities. The Learning Center, open days and evenings, provides students with more than 50 individualized carrel spaces for use with programmed instruction materials, videotaped presentations, recorded lectures, slide-tape lessons, filmstrips, film loops, simulation exercises, and a host of other media. All of these materials, whether required for assignments or used as enrichment units, may be used free of charge. Students also have available to them in this facility the Machine Aids Laboratory, consisting of calculators and typewriters.

The Modern Language Laboratory is also located on the fourth floor of the Library. Close by is the Instructional Technology Information Center, which makes available to both students and faculty more than 4,500 reference items on instructional design and media. Students will also find in this area audiovisual equipment and media production workshop facilities, especially designed to accommodate students and faculty interested in developing or improving teaching skills.

RESEARCH

One of the fundamental purposes of a university is to discover new frontiers of human knowledge through basic research. This is of great importance in a university like Northeastern, which emphasizes preparation for graduate study.

Research projects totaling approximately \$4,000,000 yearly are being performed in virtually all departments of all the Colleges, with support coming from the University, the Department of Defense, the National Institutes of Health, the National Science Foundation, and many other government agencies and private industry. Nearly all programs employ students, either as cooperative students or as graduate fellows.

A list of some of these projects, to show their diversity, would include fundamental studies in nuclear physics, relativity theory, speech analysis, determination of upper-atmosphere characteristics, solid-state theory,

microelectronics, cancer detection, energy conversion, biological applications of lasers, modification of visual threshold under hypnosis, and mathematical models describing metal alloys. At present, emphasis is being given to the development of research in the humanities and social sciences.

This research program helps Northeastern University to attract and retain the services of distinguished faculty members. You will be proud to know these men and women as professors in your classrooms.

COMPUTATION CENTER

The Computation Center has proved to be invaluable both for teaching and for research purposes. Several hundred students have programs run on the computer each day. Both faculty members and students use the Center for nonsponsored research and thesis work.

An increasing amount of research is sponsored by both governmental departments and industrial concerns.





part 5

Freshman Course Descriptions

Graphic Science

9.106 Basic Engineering I

Introduction to fundamentals of engineering graphics, including depiction of planar and solid figures. Principles of orthographic projection through primary auxiliary views. Reading and interpreting technical multi-view drawings. Elements of descriptive geometry. Construction of both isometric and oblique pictorial (3-D) drawings. Introduction to FØRTRAN IV computer programming language using a CDC-3300 computer. Basic control statements to DØ statements, including subscripted variables and FØRMAT.

9.107 Basic Engineering II

Elements of engineering design through analysis of existing designs by means of case studies, discussion of some commonly available components used to solve design-oriented problems, group and individual participation in original and open-ended design projects. Use of technical drawing to document and implement engineering design. Higher-level capabilities of digital computers, including use of and contributions to scientific subroutines, etc. Computer graphics including the making of drawings by means of a CalComp digital incremental plotter driven by the computer.

9.451 Engineering Design I

Introduction to fundamentals of engineering graphics, including depicting of planar and solid figures. Principles of orthographic projection through primary auxiliary views. Reading and interpreting of multi-view drawings. Construction of both isometric and oblique pictorial (3-D) drawings, with some emphasis on drafting techniques. Introduction to FØRTRAN IV computer programming language using a CDC-3300 computer. Data deck construction and basic control statements through IF statements.

9.452 Engineering Design II

Emphasis on engineering drawings required to support engineering design, including standard conventions, dimensioning, and production processes. More detailed drawings, such as intersections and developments, are studied. Analysis and evaluation of existing design systems are accomplished through case studies chosen to demonstrate how scientific principles are applied to design problems. Continuation of FØRTRAN programming through subscripted variables and basic DØ loops. Examples of programming as an engineering tool.

9.453 Engineering Design III

Discussion of design processes, stressing original and creative solutions. Examination of some commonly available components used to solve design problems. Involvement in both individual and group design projects. Examples of one-solution problems are considered, as well as multi-solution problems. Introduction to self-correcting (feedback) systems. Higher-level capabilities of digital computers, including Implied DØ loops and elementary scientific subroutines. Computer graphics, including the making of drawings by means of a computer-driven CalComp plotter.

9.454 Engineering Design IV

Graphical analysis of machine elements such as cams and linkages. Translatory and rotary motion involving displacement, locus generators, velocity and acceleration vectors. Simple, compound, reverted, and epicyclic gear trains. Charts, graphs, functional scales, and nomography. Computer applications to engineering and design efforts. Selected logical control and programming techniques.

Mathematics

10.101 Basic Mathematics

Development of real numbers and the algebraic operations, with emphasis placed on the field postulates. Study of polynomials, fractions, exponents, radical expressions, 1st and 2nd degree equations, solutions of inequalities, relations and functions.

10.102 Basic Mathematics (Prereq. 10.101)

Continuation of functions and relations, graphs, simple forms of conic sections, variation, exponential and logarithmic functions, systems of equations and inequalities, complex numbers.

10.103 Basic Mathematics (Prereq. 10.102)

Theory of equations, sequences and series, probability, topics in trigonometry.

10.104 Fundamentals of Mathematics (Prereq. 1 unit high school algebra)

Numerical systems; review of algebraic processes; solutions of linear and quadratic equations and inequalities; elementary matrix operations with applications; permutations, combinations, and probability.

10.105 Fundamentals of Mathematics (Prereq. 10.104 or equivalent)

Selected topics in analytic geometry; number sequences; limits and continuity of functions; geometric interpretation of a derivative; derivatives by formula; applications of derivatives to curve-sketching and problem-solving.

10.106 Calculus (Prereq. 3½ units of coll. prep. math. or 10.103, 10.105, or 10.123)

A first course for upper-class students. Differential calculus of one variable; topics in analytic geometry.

10.107 Calculus (Prereq. 10.106)

Integral calculus of one variable with an introduction to differential equations.

10.111 Calculus (Prereq. 3½ units coll. prep. math.)

A first course in calculus for freshmen majoring in Biological Sciences and Phar-

macy. Limits, particularly the derivative; topics in analytic geometry related to the application of the derivative.

10.112 Calculus (Prereq. 10.111)

Differentiation and integration of functions, with applications; topics in analytic geometry, including calculations of areas of plane figures bounded by algebraic curves. Further techniques of evaluation of limits.

10.113 Calculus (Prereq. 10.112)

Transcendental functions and their derivatives and integrals; parametric functions; applications of definite integrals and other limits.

10.124 Mathematics

Review of algebraic processes, solution of systems of linear equations, vectors and matrices, exponential and logarithmic functions, introduction to probability.

10.125 Mathematics

Introduction to differential and integral calculus, with business applications.

10.150 Calculus

Introduction to analytic geometry and to the differential and integral calculus of algebraic functions; inequalities, functions, and graphs; limits and continuity; mean-value theorem and applications.

10.151 Calculus

Differential calculus applied to maximum-minimum and rate problems; the differential; the definite integral and areas; the indefinite integral; circles and conics. The differential and integral calculus of transcendental functions.

10.152 Calculus

Linear algebra; vectors in two and three dimensions; linear transformations and matrices; vector spaces over real numbers; systems of linear equations and determinants; characteristic values and vectors.

10.181 Calculus (Prereq. 3½ units coll, prep. math.)

A first course in calculus for freshmen majoring in Mathematics or Physics. Review of basic properties of sets and the real number system; inequalities, absolute value, mathematical induction. Functions. Limits and continuity. Derivatives.

10.182 Calculus (Prereq. 10.201)

Further properties of the real number system; supremum and infimum. Properties of continuous functions; extreme values; mean-value theorem. Riemann integral; primitives; fundamental theorem of integral calculus. Integration by substitution and by parts. Transcendental functions. Taylor's formula with remainder, indeterminate forms, l'Hopital's rule.

10.183 Calculus III

Continuation of 10.182

10.203 Algebra

Elementary linear algebra; vectors in two and three dimensions; linear transformations and matrices; vector spaces over real numbers; systems of linear equations; determinants; characteristic values and vectors.

10.307 College Algebra and Trigonometry I (Prereq. Math. Placement Test or 10.302)

Fundamental operations of algebra; algebraic fractions; exponents and radicals; functions. Trigonometric functions of angles both in degree and in radian measure; right triangles; identities and equations.

10.308 College Algebra and Trigonometry II (Prereq. 10.307)

Quadratic equations and applications; radical equations; complex numbers; binomial expansion; variation; roots of polynomial equations. Trigonometric graphs; other transcendental functions, logarithms, inverse trigonometric functions.

10.320 Calculus I (Prereq. 10.308, or 10.503, or 10.507)

Functions, graphs, and limits; study of the straight line, the circle, the parabola; differentiation of algebraic functions, with applications, including the mean-value theorem; continuity.

Physics

11.115 Fundamentals of Physics I (Physics for Humanists)

The first quarter of a two-quarter sequence intended primarily for students in the humanities and social sciences. Some of the basic principles governing the physical universe are established without using more mathematics than simple algebra. This course is directed at the intellectually curious student, and attempts both to teach him some physics and to show him how scientific modes of thought are related to others with which he is more familiar. The first quarter discusses material in mechanics and thermodynamics.

11.116 Fundamentals of Physics II (Prereq. 11.115)

Continuation of 11.115. Electromagnetic theory and atomic physics.

11.117 Physics for Science Majors I (Calculus required as prerequisite or concurrently)

The first quarter of a three-quarter sequence for all science majors. Kinematics, Newton's laws of motion, momentum and energy, the conservation laws, gravitation.

11.118 Physics for Science Majors II (Prereq. 11.117)

Fluid mechanics, heat, wave motion, optics.

11.119 Physics for Science Majors III (Prereq. 11.117 but *not* 11.118)

Electrostatics, currents, magnetic fields, electromagnetism.

11.171 Basic Physics I (Physics for the Health Sciences)

The first quarter of a two-quarter physics sequence intended primarily for students who are oriented toward the health sciences and athletics, including many students in Biology, Pharmacy, Physical Therapy, and Physical Education. No calculus re-

quired. The emphasis is on the laws of physics as they relate to problems in the life sciences. The first quarter discusses topics in mechanics, thermodynamics, and waves.

11.172 Basic Physics II

Continuation of 11.171. Electricity and magnetism and light.

11.173 Physics Laboratory I

The first quarter of a two-quarter laboratory sequence. The student performs experiments from various fields of physics.

11.174 Physics Laboratory II

Continuation of 11.173.

11.203 Elementary Physics I (Physics for Engineers)

The first quarter of a four-quarter sequence intended primarily for Engineering students. The student is assumed to be concurrently taking a four-quarter calculus sequence. The aim of the course is to give the student a working knowledge of physics. The first quarter discusses vector algebra and the dynamics of particle motion.

11.204 Elementary Physics II (Physics for Engineers)

Continuation of 11.203. Conservation laws and their use in solving problems in elementary dynamics. Wave motion and vibrating systems.

11.205 Elementary Physics III (Physics for Engineers)

Continuation of 11.204. Electricity and magnetism.

11.317 Physics I (Mechanics) (Prereq. 10.307 or concurrently)

Kinematics and dynamics of particle motion; Newton's laws; projectile and circular motion; conservation laws for momentum and energy; rotational motion; simple harmonic motion.

11.318 Physics II (Wave Motion, Sound, Heat) (Prereq. 11.317)

Wave motion, intensity, interference phenomena, Doppler effect, vibrating systems, temperature, heat, change of state, heat transfer, kinetic theory of gases, general gas laws, thermodynamics.

11.319 Physics III (Electricity, Magnetism, Light) (Prereq. 11.318)

Electrostatics, magnetism, magnetic induction, induced currents, direct and alternating current circuits, properties of light, reflection, refraction, dispersion, optical systems, diffraction, polarization.

Chemistry

12.101 General Chemistry

Introduction to the principles of chemistry, with emphasis on stoichiometry, ionic solutions, and the inorganic chemistry of biological systems.

12.102 General Chemistry (Prereq. 12.101)

Introduction to organic chemistry with emphasis on compounds of biological significance.

12.103 General Chemistry

For Chemistry majors and selected Biology majors. Stoichiometry, atomic structure, chemical bonding, acids and bases, oxidation-reduction, states of matter, solutions. Laboratory: introduction to qualitative analysis.

12.104 General Chemistry (Prereq. 12.103)

For Chemistry majors and selected Biology majors. Chemical equilibria, introduction to chemical thermodynamics and kinetics, electrochemistry, nuclear chemistry, topics in inorganic and organic chemistry. Laboratory: qualitative analysis.

12.105 Analytical Chemistry (Prereq. 12.104)

The principles and practice of experimental measurements by means of chemical reactions. Laboratory: quantitative analysis.

12.106 General Chemistry

For non-Chemistry majors. Atomic structure and periodicity, chemical bonding, stoichiometry, solutions, states of matter, chemical equilibrium, acids and bases, ionic equilibrium, oxidation-reduction, electrochemistry. Illustrative laboratory experiments.

12.107 General Chemistry (Prereq. 12.106)

For non-Chemistry majors. Qualitative analysis, colloidal dispersions, spontaneous reactions, chemical kinetics, topics in inorganic and organic chemistry, nuclear chemistry. Laboratory: qualitative analysis.

12.108 Fundamentals of Chemical Sciences I

Development and discussion of important principles and concepts of the chemical sciences. Intended for students in the social sciences and humanities with minimal background in science and mathematics. The objective of 12.108 and 12.109 is to give the nonscience student an appreciation and some knowledge of the role in chemistry in our technical society and in our everyday lives.

12.109 Fundamentals of Chemical Sciences II

Continuation of 12.108. Discussion of the chemistry involved in such basic human needs as food, clothing, shelter, transportation, and energy production. Other topics (e.g., environmental problems) may be included or substituted, since students will participate in selecting topics for discussion.

12.114 General Chemistry

Primarily for Engineering students. Introduction to the principles of chemistry, focusing upon the states and structure of matter and chemical stoichiometry.

12.115 General Chemistry (Prereq. 12.114)

Primarily for Engineering students. Introduction to the principles of chemistry, focusing upon chemical equilibria and the nature of some common materials.

12.171 Analytical Chemistry

Theories, principles, and applications of volumetric, gravimetric, and instrumental methods of analysis.

Earth Sciences

16.104 Introduction to Earth Science

This course considers both the solid and liquid environments of the earth. The forces and factors producing changes in these environments are examined in some detail and are applied to an understanding of the historical development of the earth.

16.105 Introduction to Earth Science

A continuation of 16.104. Consideration of the gaseous envelope surrounding the earth and the meteorological phenomena that occur within it is followed by a study of the earth as an astronomical body. Particular emphasis is placed on the behavior of the earth as a member of the solar system.

16.141 Physical Geology

A study of natural phenomena ranging from landscape forms and scenery to the catastrophies brought about by earthquakes, volcanic eruptions, floods, and hurricanes. Field trips will emphasize cause and effect.

16.142 Historical Geology

The unfolding of the history of the earth, its inhabitants and its events in answer to the question "When?" Emphasis will be placed on the origin of the earth, the succession of life on earth, and the coming of man.

16.180 Physical Geography I

Constructed to bring an understanding of man's physical environment with concentration of study upon weather, climate, and vegetation on a worldwide scale.

16.182 Physical Geography II

An interpretative description and analysis of landforms and soils. Emphasis will be placed on an examination of landform development and distribution.

Biology

18.107 Integrated Science

Principles of chemistry and microbiology.

18.108 Integrated Science (Prereq. 18.107)

Human anatomy and physiology.

18.109 Integrated Science (Prereq. 18.108)

Human anatomy and physiology. Development and inheritance.

18.120 Basic Microbiology

Microbial life, emphasizing morphological characteristics, physiological activities, and disease production.

18.131 General Biology

Universal properties and processes of living organisms. Cellular composition and activities, inheritance and cellular control, the evolutionary process, environmental relationships.

18.132 Animal Biology (Prereq. 18.131)

Systematic comparative study of the structure and functions of animals. Diversity of animals considered from the standpoint of evolutionary adaptation.

18.141 Basic Animal Biology

Principles of biology. Universal properties and processes of living organisms as exemplified by the cell and its activities. Inheritance, evolution, and environmental relationships.

18.142 Basic Animal Biology (Prereq. 18.141)

Structure and function of organ systems and animals. Diversity of animals considered from the evolutionary standpoint.

18.148 Human Anatomy

The structure and development of the human body.

Psychology

19.101 Introductory Psychology

Psychological principles.

19.102 Basic Psychology

The basic principles of psychology.

19.105 Foundations of Psychology I

Major concepts from most areas of psychological investigation; the experimental approach to the study of behavior including growth and development, individual differences, learning and social psychology.

19.106 Foundations of Psychology II (Prereq. 19.105)

The sensory bases of response, perception, motivation, emotions, personality, and behavioral disorders.

19.141 Growth and Development I

Emphasis on infancy and childhood. Fundamental processes of growth and development from conception to the beginning of adolescence; physical development and maturation; socialization; social and interpersonal relations; personality cognition; intelligence, emotion and motivation. Emphasis upon family setting as well as upon the broader social environment.

19.142 Growth and Development II

Adolescence and adulthood. Exploration of physical and social changes in the years from adolescence to senescence. Consideration of special circumstances and problems associated with adult life.

Anthropology

20.100 Principles of Social Anthropology

An introduction to the general fields of anthropological investigation, their scope, and the nature of the integration of the subdisciplines in the concept of culture. Focus on concepts of social structure and organization, function, change, and evolutionary concepts of emerging levels of societal integration.

Sociology

21.100 Principles of Sociology

The basis of human society, the process of individual adjustment to society and the matter of numbers, spatial distribution, and organization of people. Social organization, social institutions, personality development, and institutional life.

Political Science

22.101 Introduction to Political Science I

A study of basic political concepts and forces of organization from the classical Greeks to the modern nation-state. The Soviet Union and the United Kingdom are contrasted as contemporary illustrations of the institutional distinction between a totalitarian and a constitutional system.

22.102 Introduction to Political Science II (Prereq. 22.101)

The development of operational liberty in the United States and its constitutional underpinnings are considered, together with an analysis of the national American political process and the conduct of recent American foreign relations.

History

23.101 Western Civilization

The major ideas and institutions of western civilization from ancient times to 1789.

23.102 Western Civilization

A continuation of 23.101, covering the period since 1789.

23.210 The United States to 1865

The history of the American people from 1763 to 1865, with an analysis of the American Revolution and of the major political, constitutional, diplomatic, economic, and social problems of the new nation.

23.211 The United States Since 1865

A continuation of the survey of American history with discussion of the emergence of an industrial economy, an urban society, world responsibility, and expanded Federal government.

Philosophy & Religion

26.101 Introduction to Philosophy I

26.102 Introduction to Philosophy II

An examination of a few of the more persistent and compelling issues in philosophy. These courses are independent, but both emphasize philosophical thinking as an activity rather than an assimilation of an established body of facts. 26.101 includes such topics as theories of reality and knowledge, and philosophical problems in religion. 26.102 includes topics of social and political philosophy, philosophies of art and history.

Art History

27.118 History of Art I

A survey of western art from prehistoric times to the Renaissance.

27.119 History of Art II (Prereq. 27.118)

A survey of western art from the Renaissance to the twentieth century.

Music

28.100 Music I

Emphasis on the techniques of listening: instrumental and vocal tone color, melodic contour, rhythmic pattern, compositional design and style, harmony. *This course may serve either as preparation for general listening or for other music courses.*

28.123 Music of the Romantic Era

Romantic realism and Romantic idealism after Beethoven. Composers to be studied include Schumann, Schubert, Berlioz, Liszt, Chopin, Wagner, Brahms, Tschaikovsky, and Mahler.

28.145 Beethoven

An analysis of the complex personality and art of this major figure. His relation to the turbulent times in which he lived, his role in Classic and Romantic music.

Drama and Speech

29.106 Speech Fundamentals

Basic principles and techniques of effective modern speaking. Examination of individual voice and articulation problems. The study and application of basic techniques of oral interpretation.

29.121 Survey of the Theatre I

Introduction to the drama as a dynamic medium of human expression; historical development of the theatrical form; reading and analysis of selected plays as they relate to form, genre, style, from the point of view of audience and artist.

29.122 Survey of the Theatre II

Introduction to the theatre as a collaborative art form (theoretical and practical) with an emphasis upon acting, directing, design, lighting, and the necessities of theatre economics.

English

30.113 Freshman Writing

Important principles of logic and rhetoric applied to exposition and argumentation writing; review of sentence structure, punctuation, and paragraphing; extensive reading and analysis of the essay form; theme assignments.

30.114 Introduction to Literature

An introduction to literary forms: poetry, prose fiction, and drama. Intensive reading in various forms, and discussion of different approaches to literature.

30.115 Great Themes in Literature (Prereq. 30.114)

Content determined by instructor, who chooses a theme and a number of books from different periods to illustrate it. Examples: The Hero in Literature, Visions of Utopia, Science Fiction.

French

31.115 Intermediate French (Prereq. 31.103 or 31.152)

Course for upperclassmen. Brief review of grammar and thorough oral work and the reading of selected texts.

31.116 Intermediate French

Continuation of 31.115, with greater emphasis on reading.

31.131 Masterpieces of French Literature (Prereq. 31.113 or 31.116)

Introductory course in French literature. Selected works from the Middle Ages to the eighteenth century.

31.132 Masterpieces of French Literature (Prereq. 31.113 or 31.116)

Introductory course in French literature. Selected works from the nineteenth and twentieth centuries.

31.151 Elementary French I

Essentials of grammar; practice in speaking and reading; progressive acquisition of basic language skills.

31.152 Elementary French II (Prereq. 31.151)

Continuation of grammar study and basic language skills; reading of French of increasing difficulty; practice in conversation.

Spanish

32.115 Intermediate Spanish (Prereq. 32.103 or 32.152)

Spanish civilization through texts of average difficulty. Intensive reading of modern prose, with occasional oral and written translation; conversation practice based on assigned readings.

32.116 Intermediate Spanish (Prereq. 32.115)

Spanish-American civilization through texts of average difficulty. Intensive reading of modern prose, with occasional oral or written translation; conversation practice based on assigned readings.

32.131 Masterpieces of Spanish Literature I (Prereq. 32.116)

Introductory course in Spanish literature. Selected works from the Middle Ages to the *Siglo de Oro*.

32.132 Masterpieces of Spanish Literature II (Prereq. 32.131 or 32.116)

Introductory course in Spanish literature. Selected works from the nineteenth and twentieth centuries.

32.151 Elementary Spanish I

Essentials of grammar; practice in pronunciation; progressive acquisition of a basic vocabulary; and idiomatic expressions.

32.152 Elementary Spanish II

Continuation of grammar study. Oral and written exercises; reading of basic Spanish prose.

German

33.115 Intermediate German (Prereq. 33.103)

German civilization through texts of average difficulty; review of grammar; written and oral exercises.

33.116 Intermediate German (Prereq. 33.115)

Readings from modern German prose; conversational practice.

33.131 Masterpieces of German Literature I (Prereq. 33.116 or permission of instructor.)

Important works of poetry and prose from the twentieth century. The course aims to increase the student's reading ability while introducing him to the major genres and authors.

33.132 Masterpieces of German Literature II (Prereq. 33.131 or permission of instructor.)

Important works of poetry and prose from the nineteenth century. The course aims to increase the student's reading ability while introducing him to major genres and literary movements.

33.151 Elementary German I

Essentials of grammar; practice in pronunciation; acquisition of a basic vocabulary; idiomatic expressions.

33.152 Elementary German II (Prereq. 33.151)

More difficult points of grammar; reading of simple German prose, with oral and written exercises.

Economics

39.105 Principles of Economics

Development of macroeconomic analysis; review of national income concepts; na-

tional income determination, fluctuation, and growth; role of the banking system and the Federal Reserve System; government expenditures and taxation; international trade; balance of international payments.

39.106 Principles of Economics

Comprehensive analysis of the economics of the firm with illustrative cases. Demand, cost, and output relationships examined. Market structures and the public interest include examination of antitrust policy, economic efficiency, research and innovation, advertising, and economic concentration. Some emphasis placed on theory versus practice.

39.115 Principles and Problems of Economics

An introduction to the conceptual aspects of economics; the flow of national income; economic growth and fluctuation; the role of money and banking; monetary and fiscal policies; emphasis on developing conceptual tools for use in the analysis of economic problems facing modern society.

39.116 Principles and Problems of Economics

Development of basic theory of demand, supply, and market price; applications to selected microeconomic problems, such as basic economics of monopoly and competition, poverty, race, and discrimination, urban affairs, pollution, and other problems which relate to the role of the pricing system in resource allocation and income distribution.

Accounting

41.111 Principles of Accounting

An introduction to the nature and purposes of accounting. Use of accounting information. Basic concepts of accounting; measuring business financial positions and income; accounting for the acquisition of assets.

41.112 Principles of Accounting (Prereq. 41.111)

Accounting for the financing of business. Recognition and classification of revenues and costs; general purpose financial reporting. Measuring the flow of funds; appraising financial results.

Business Administration

49.100 Introduction to Business

The business organization as a system of interrelated functions and operations; the interactions between the organization and its environment; the role of management in business organization. The organization and operation of business enterprise. The significance of later studies in business administration for the business organization.

Education Foundations

50.111 Social Science I

Cultural anthropology and education. Theories and concepts in cultural anthropology will be studied with primary emphasis on their relevance to informal and formal aspects of educational processes. Considerable attention will be devoted to the study

of cross-cultural materials in order to understand the educational process in different cultural milieus.

50.112 Social Science II

Sociology and education. The course involves sociological analysis of the educational enterprise in the United States and other technologically advanced societies, including consideration of the socialization process, the formation of youth cultures, and the function of the schools in these contexts. Attention will be given to the study of the effects of stratification, ethnic, and racial factors on educational institutions; education and social change; and the school as a social system.

50.113 Social Science III

Intergroup relations and education. Examination of theoretical and empirical materials relative to the problem of intergroup relations and prejudice. Particular attention will be paid to the role of education in the reduction of intergroup conflict.

Health Education

65.110 Foundations of Health Education

Orientation to school health education; introduction to the conceptual approach in health education, with emphasis on personal health and factors influencing health; and introduction to the philosophy of health education.

65.129 Health Education

Principles of personal health; emphasis on information pertinent to mental and physical well-being, current social behavior, and effective approaches to college living.

65.130 Health Problems of the College Student

Discussion of the major health problems affecting college students. Principles of personal health, with emphasis on healthful college living (Physical Education majors only).

Physical Education

62.201 Human Movement

An introduction to the nature and role of human movement and the analysis of skillful movement performance through participation and observation. Introduction to the objectives, literature, and organization of the profession of physical education.

62.203 Practicum in Group Dynamics (Prereq. 62.201)

A two-week residence group living experience at the Warren Center. An introduction to group dynamics through selected activities, discussion, and living and working together.

62.206 First Aid

First aid procedures recommended for the home, school, and community; emphasis on practices endorsed by the American Red Cross.

62.215 Observation of Student Behavior (Prereq. 62.201)

An introduction to the growth and development of elementary children and adolescents in physical education through direct observations and laboratory work with children.

62.249 Physical Science Foundations (Prereq. 62.201)

A treatment of basic concepts and fundamentals of chemistry and physics as applied to human physiology and movement.

Recreation Education

63.120 Professional Orientation to Recreation

Philosophy and scope of modern recreation and its role in society. Discussion of opportunities at home and abroad in school and community settings, in agencies, hospitals, institutions, and industries. Focus on goals for American recreation (includes unit on study habits).

63.121 Recreation Skills I

Skill development and participation in the recreational activities: volleyball, badminton, social recreation, guitar and piano (includes unit on study habits).

63.122 Recreation Skills II

Skill development and participation in gymnastics, folk dance, swimming, music analysis, song leading, and instrumental accompaniment (includes unit on practical mathematics).

63.123 Recreation Skills III

Development of leadership skill in social recreation activities: singing, folk dance, games and party program planning, including leadership experiences with groups. Counselor education — philosophy and leadership methods in camping. Red Cross lifesaving course. Includes unit on business mathematics.

63.125 Outdoor Education and Camp Leadership

A two-week resident summer session at Warren Center and in Maine: includes natural science, aquatics, overnight camping, Indian lore, ACA Campcraft certification, leadership in special camp programs, outdoor sports, smallcraft training, and arts and crafts.

Physical Therapy

64.111 Introduction to Physical Therapy

Orientation in the field of physical therapy and its role in the health professions.

64.113 Introduction to Physical Therapy (Prereq. 64.111)

Theory and practice in body mechanics, postural examinations, and basic procedures relating to patient management.

Pharmacy and Allied Health Professions

Pharmacy

71.201 Pharmacy Orientation

Designed to introduce the beginning pharmacy student to simple fundamentals in using basic tools and equipment in the practice of pharmacy. Modern audiovisual aids will explain the prescription balance, graduals, mortars and pestles, filtration, emulsification, tablet triturates, ointments and creams, suppositories, and prescription packaging.

71.202 Pharmacy Orientation (Prereq. 71.201)

Pharmaceutical calculations designed to enable a student to carry out the necessary steps in preparations and prescriptions. A programmed instruction text will be used.

Respiratory Therapy

86.191 Physical Basis of Respiratory Dynamics

An introduction to respiratory therapy: basic respiratory anatomy and physiology, basic physical and chemical principles.

86.192 Physical Basis of Respiratory Dynamics II

Continuation of 86.191. Human ventilation and acid-base balance.

86.193 Mechanical Basis of Respiratory Therapeutics

Principles of basic equipment used in respiratory therapy: pressure regulators, flow-meters, and artificial airways and ventilators.

Medical Laboratory Science

87.100 Laboratory Medicine Orientation

The history and development of medical laboratory technology and pathology.

87.101 Basic Medical Laboratory Science (Prereq. 18.132, and 12.104 or 12.107)

Introduction to basic medical laboratory science: methods, principles, and theories.

Dental Hygiene

DH-11, 12, 13 Dental Hygiene

A series of lectures, discussions, and assignments introducing the student to the principles and skills required in providing patient dental health care. Factors influencing the clinical practice: patient education, interpersonal relationships, ethics, and jurisprudence. Emphasis is placed upon the hygienist's role in nutrition counseling.

DH-11C, 12C, 13C Clinical Dental Hygiene

Integrated clinical demonstrations and practice are correlated with the lecture series presented in DH-11, 12, 13. Instruction in the techniques of performing the complete oral prophylaxis. Auxiliary procedures such as case histories, oral inspection, charting, fluoride applications, and patient instruction. Instrument sharpening and care of instruments and equipment.

Nursing

80.101 Fundamentals of Nursing

This course is basic to all other courses in nursing in the Associate Degree Program. The focus is on the patient as an individual. Underlying this is the concept of homeostasis and the role of the nurse in meeting human needs. Nursing action is based upon principles drawn from the behavioral, social, and biological sciences. Assignments in patient care are designed to provide the student with opportunities to interpret these principles in the promotion of health and prevention of illness.

80.102 Fundamentals of Nursing (Prereq. 80.101)

This is the second nursing course in the Associate Degree Program. The major focus is on the identification of common deviations from homeostasis and the supportive nursing measures involved in the restoration of the patient to homeostasis.

80.103 Fundamentals of Nursing (Prereq. 80.102)

In the third course in the Associate Degree Program, the major focus is on the identification of specific long-term deviations from homeostasis and the nursing actions involved in the restoration of the patient to optimal function and adaptation.

80.201 Nursing

The first course in the Baccalaureate Degree Program introduces the student to the varying levels of educational preparation in nursing; the philosophy, purposes, and objectives of the program; interpretation of the student's own health behavior patterns; identification of man's basic needs, according to Maslow; identification of patterns of meeting the student's own needs; distinguishing the physiological, sociological, and psychological components of human sexuality; communication techniques; interpersonal processes; roles and role conflicts; group dynamics and group processes; and methods of problem-solving.

80.202 Nursing (Prereq. 80.201)

The second course in the Baccalaureate Program assists the student in identifying the general social trends and their implications for nursing; the characteristics of a profession; the functions and purposes of nursing organizations; the standards of behavior of the professional nurse; the fundamental principles of malpractice law, legislation affecting health care, and the factors influencing the delivery of health care; major world health problems affecting the welfare of communities; and the roles and responsibilities of the comprehensive health team.

80.203 Nursing (Prereq. 80.201, 80.202)

The third course in the Baccalaureate Program introduces the student to the science of nutrition. It helps the student recognize factors influencing the formation of food habits for his or herself and others; in identifying normal nutrient needs according to age groups; in recognizing the need for objectivity in working with individuals in meeting their needs, as well as the importance of nutrition and its relationship to health. Medical terminology commonly used in nursing is studied.

Military Science

Military Science I

91.101 U.S. Defense Establishment

Emphasis is given to the history, organization, and mission of the Department of Defense. Further, the mission and organization of the U.S. Army is taught, with emphasis given to the integration of small units into larger units and the general design of military organization.

91.102 Map Reading and Aerial Photography (Prereq. 91.101)

Reading of maps and aerial photographs to include appreciation of basic principles. Emphasis is on terrain analysis and evaluation, marginal information, military and topographic map symbols, military and reference systems, methods of orientation, intersection and resection, use of compass, and types of aerial photographs.

91.103 Leadership Laboratory (Prereq. 91.102)

Progressive training in leadership, drill, and command. Exercise in command is stressed wherein students perform duties and functions as officers incident to conduct of training.

Criminal Justice

92.201 History of Criminal Justice

An historic survey of the principles of criminal justice in the ancient and medieval periods with emphasis upon the impact of religion and philosophy.

92.202 History of Criminal Justice

A continuation of the historic survey with an examination of the effect of the Renaissance and Reformation and the rise of nation-states.

92.203 History of Criminal Justice

Criminal justice in the modern and contemporary periods from the eighteenth century to the present.

Contents Detailed

- A Message from the President, 3
- About Education, 7
- The Philosophy of Education, 8
- The Problem of Education, 9
- The Plan of Education, 9
 - The Cooperative Plan, 9
- The Place, 10
- The Faculty, 12
- A Message from the Dean of Admissions, 13
- The Academic Programs, 15
 - Boston-Bouvé College, 17
 - Health Education, 19
 - Freshman-Year Program of Studies in Health Education, 20
 - Physical Education, 20
 - Freshman-Year Program of Studies in Physical Education, 21
 - Physical Therapy, 22
 - Freshman-Year Program of Studies in Physical Therapy, 23
 - Recreation Education, 23
 - Freshman-Year Program of Studies in Recreation Education, 24
 - College of Business Administration, 27
 - Freshman-Year Program of Studies, 29
 - Accounting, 30
 - Marketing, 30
 - Finance and Insurance, 31
 - Industrial Relations, 32
 - International Business, 33
 - Management, 33
 - Small Business Management, 34
 - Transportation, 34
 - College of Criminal Justice, 37
 - Freshman-Year Program of Studies, 38
 - College of Education, 41
 - Freshman-Year Program of Studies in the Teaching of Nonscience Fields, 43
 - Elementary Education, 43
 - Secondary Education, 44
 - Speech and Hearing Therapy, 45
 - Freshman-Year Program of Studies in the Teaching of General Science, Earth Sciences, or Biology, 46
 - Freshman-Year Program of Studies in the Teaching of Mathematics or Physics, 46
 - Freshman-Year Program of Studies in the Teaching of Chemistry, 46
- College of Engineering, 49
 - Freshman-Year Program of Studies, 50
 - Chemical Engineering, 51
 - Civil Engineering, 52
 - Electrical Engineering, 54
 - Industrial Engineering, 56
 - Mechanical Engineering, 58
 - General Engineering, 61
 - Biophysics and Biomedical Engineering, 62
- College of Liberal Arts, 65
 - Freshman-Year Program of Studies, 67
 - Art History, 68
 - Biology, 68
 - Chemistry, 70
 - Drama, 71
 - Economics, 72
 - English, 74
 - Geology, 74
 - History, 75
 - Independent Major, 76
 - Journalism, 77
 - Mathematics, 78
 - Modern Languages, 79
 - Philosophy, 80
 - Physics, 81
 - Political Science, 82
 - Psychology, 83
 - Sociology and Anthropology, 85
- Lincoln College, 89
 - Freshman-Year Program of Studies, 90

Electrical Engineering
 Technology, 91
 Mechanical Engineering
 Technology, 92
 Aviation Technology, 94
 College of Nursing, 97
 Freshman-Year Program of
 Studies for the Associate
 Degree, 99
 Freshman-Year Program of
 Studies for the Baccalaureate
 Degree, 100
 College of Pharmacy and Allied
 Health Professions, 103
 Pharmacy, 104
 Freshman-Year Program of
 Studies, 106
 Medical Record Administration, 106
 Freshman-Year Program of Studies
 in Medical Record
 Administration, 107
 Medical Laboratory Science, 108
 Medical Technology, 108
 Medical Laboratory
 Technology, 109
 Cytotechnology, 110
 Freshman-Year Program of Studies
 in Medical Laboratory
 Science, 111
 Dental Hygiene, 111
 Freshman-Year Program of Studies
 in Dental Hygiene, 112
 Radiologic Technology, 112
 Management in Health Agencies
 and Institutions, 112
 Respiratory Therapy, 113
 Freshman-Year Program of Studies
 in Respiratory Therapy, 114
 Reserve Officers' Training Corps
 (ROTC), 117
 The Particulars of Education, 121
 The Department of Admissions, 122
 General Requirements for
 Entrance, 123
 Applying for Admission, 126
 Expenses, 129
 Financial Aid, 132
 Scholarship Programs, 133
 Student Loan Programs, 135
 Part-Time Work, 136
 Housing, 137
 Student Activities, 137

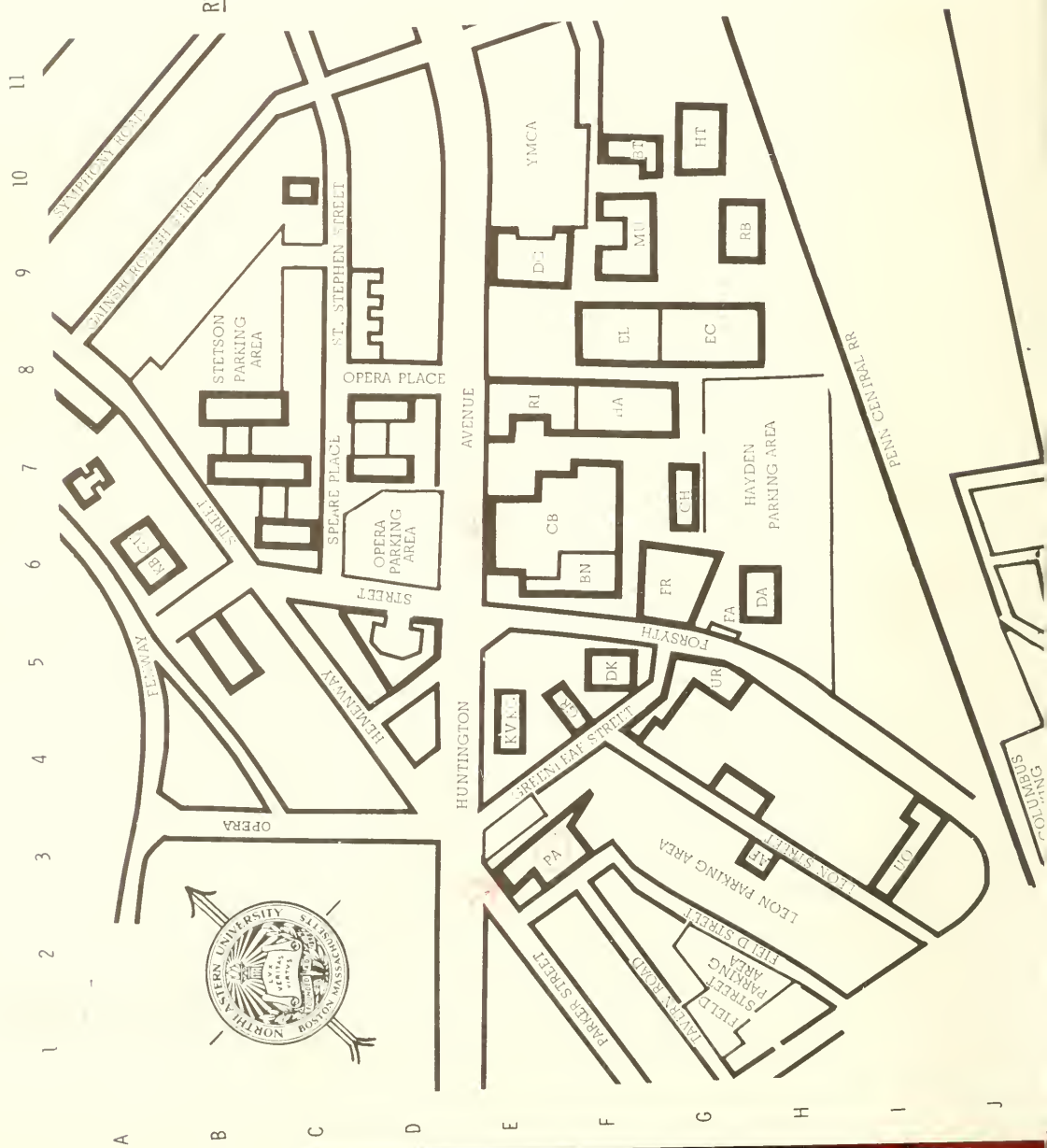
 The Department of Athletics, 143
 Freshman Orientation
 Programs, 144
 The Counseling and Testing
 Center, 144
 The Faculty Advisory System, 145
 The Pillars of Education, 149
 The University Library, 151
 Learning Resources, 152
 Research, 152
 Computation Center, 153
 Freshman Course Descriptions, 155
 Graphic Science, 156
 Mathematics, 157
 Physics, 159
 Chemistry, 160
 Earth Sciences, 162
 Biology, 162
 Psychology, 163
 Anthropology, 164
 Sociology, 164
 Political Science, 164
 History, 164
 Philosophy & Religion, 165
 Art History, 165
 Music, 165
 Drama & Speech, 165
 English, 166
 French, 166
 Spanish, 166
 German, 167
 Economics, 167
 Accounting, 168
 Business Administration, 168
 Education Foundations, 168
 Health Education, 169
 Physical Education, 169
 Recreation Education, 170
 Physical Therapy, 170
 Pharmacy, 171
 Respiratory Therapy, 171
 Medical Laboratory Science, 171
 Dental Hygiene, 171
 Nursing, 172
 Military Science, 173
 Criminal Justice, 173
 Map of Main Campus, 176
 Freshman Academic Calendar,
 inside back cover
 Admissions Application,
 insert at back

Building
Designation

BN	Barletta Natatorium
BT	Botolph Building
CB	Cabot Physical Education Ctr.
CH	Churchill Hall
CU	Cushing Hall
DA	Dana Research Center
DK	Dockser Hall
DG	Dodge Library
EC	Eli Student Center and Alumni Auditorium
EL	Forsyth Building
FR	Forsyth Building Annex
FA	Greenleaf Building
GR	Hayden Hall
HA	Hurtig Hall
HT	Kennedy Building
KB	Knowles Center (Volpe)
KV	Knowles Center (Gryzmish)
KG	11 Leon Street
UO	Afro-American Institute
AF	Mugar Life Sciences Building
MU	Parker Building
PA	Richards Hall
RI	Robinson Hall
RB	United Realty Building
UR	

MAP
REFERENCE

F6	F10	E6	G7	A6	H6	F5	E9	G8	F8	G6	G5	F4	F7	G10	B6	E4	E4	J3	H3	F9	F3	E7	H9	G5
----	-----	----	----	----	----	----	----	----	----	----	----	----	----	-----	----	----	----	----	----	----	----	----	----	----



FRESHMAN ACADEMIC CALENDAR

September 1973 to June 1974

FALL QUARTER

SEPTEMBER 20 (Thursday): Registration at 9:00 a.m.

SEPTEMBER 20, 21, 24 (Thursday, Friday, and Monday): Orientation Week Exercises. Attendance of all freshmen is required.

SEPTEMBER 24 (Monday): No classes because of upper-class and continued freshman registration.

OCTOBER 8 (Monday): Observance of Columbus Day—no classes.

OCTOBER 22 (Monday): Observance of Veterans' Day—no classes.

NOVEMBER 22, 23 (Thursday–Friday): No classes—Thanksgiving Holiday.

DECEMBER 10–14 (Monday–Friday): Final examinations for Fall Quarter.

DECEMBER 17–JANUARY 1 (Monday–Tuesday): Christmas Vacation—no classes.

WINTER QUARTER

JANUARY 2 (Wednesday): Registration for Winter Quarter (upper-class, freshman Quarter Two, and January section of freshmen)—no classes.

FEBRUARY 18 (Monday): Observance of Washington's Birthday.

MARCH 18–22 (Monday–Friday): Final examination period.

MARCH 25–29 (Monday–Friday): Vacation period—no classes.

SPRING QUARTER

April 1 (Monday): Registration for Spring Quarter (upper-class, freshman Quarter Three, and January freshman Quarter Two)—no classes.

APRIL 15 (Monday): Observance of Patriots' Day.

MAY 27 (Monday): Observance of Memorial Day.

JUNE 10–14 (Monday–Friday): Final examination period.

Your Application for Admission is at the back of this catalog.

Northeastern University
Department of Admissions
360 Huntington Avenue
Boston, Massachusetts 02115

Non-Profit Organization
U. S. POSTAGE
PAID
BOSTON, MASS.
Permit No. 430



NORTHEASTERN UNIVERSITY LIBRARIES



3 9358 01116272 1

NORTHEASTERN UNIVERSITY LIBRARIES DUPL



3 9358 01116272 1